Industrial Finishing

Reg. U. S. Pat. Off.

An Independent Publication Devoted to the Finishing of Industrial Products

Vol. VII, No. 11 **SEPTEMBER, 1931** **$2.00 a Year**

Contents of this Issue

From the Editor's Desk 5

Feature Articles—

Finishing 30 Years from Now, by B. Sanderson 7
Painting and Finishing Railway Rolling Stock, by E. Perry 10
Finishing Electric Light Fixtures, by A. L. Medel 14
Toy Finishing Methods, by E. W. Windsor 18
Wood Fillers and How to Use Them—II, by C. D. Youngs 26
New Materials and Equipment 30
"Questions and Answers" Section 39
"Metal Finishing" Department 51
How We Reduced Enameling Costs, by Fred Deering 51
Ford Automobile Finish—II, by P. C. Bardin 58

"New Materials and Equipment" Section 30

New Lacquer Stain 30
Cleaning and Drying Machine 30
Barrett Filwhirl Enameler 32
Mechanical Air-Painting 32

"Questions and Answers" Section 39

"Metal Finishing" Section 51

Short Articles

Finishing Engines 9
W. H. McCartney Joins Eureka 9
Hercules Chemists End Research in Germany 9
Reports Business Improvement 9
Railway Cars Aluminum Painted 13
Worthington Staff Appointments 13
DuPont Oil Colors 28
Guyer of DeVilbiss Returns from West 28
Furniture Assn. Plans Promotional Work 34
Finish Corporation Organized. 34
Dolan Opens Branch Office 34
Meetings Scheduled Next Month 34
Worthington Acquires Metalweld 49
Air Heating Folder 57
Pearl Essence; Richelieu Cloisonne 57
Aluminum Paint Booklet 65
Melting and Coating Tanks 65
Oven Baking; Annealing 66
Lacquer for Metal Protection. 66
Nickel Brass; Chrome Brass .. 67
Paasche Announces Changes in Personnel 67
H. B. Young & Co. Merge with E. T. Stille & Co 67

Editorial 68

"Classified Advertising" Section 70

Advertisers' Index 71

Copyright 1931

Published by PRACTICAL PUBLICATIONS, INC., 802 Wulsin Bldg., Indianapolis, Ind.

Eastern Representative—C. A. Larson
254 West 31st St., New York
Phone, Penna. 9049

Western Representative—H. L. Watrous
611 Wrigley Bldg., Chicago
Phone, Superior 2429

LINDOL

A NEW HIGH STANDARD OF QUALITY

in technical grades of Tricresyl Phosphate at

NEW PRICES

LINDOL-A is now 100% ester value, entirely free from impurities and is water white.

LINDOL-B is also improved, being over 99% ester value and practically water white.

These plasticizers are recognized as superior blending agents for nitrocellulose and resins. Lindol plasticized films are tough, hard, permanently flexible, non-shrinking, adhesive and non-blooming, and sand and rub freely and easily to an excellent lustre.

Lindol has stood the time test of service.

These products may now be obtained in single trip containers.

CELLULOID CORPORATION

Sales Office:
10 E. 40th St.
New York, N. Y.

Factory:
290 Ferry St.
Newark, N. J.

From the Editor's Desk

MANUFACTURING concerns in every line would receive more inquiries and get more business if they advertised what they have to sell to the people who are interested—and many new people are interested now as a result of new set-ups in industrial organizations. Evidence of this fact comes to INDUSTRIAL FINISHING magazine in practically every mail. Officials of concerns manufacturing products that must be finished are continually inquiring where or from whom they can buy certain materials, equipment, supplies, etc. For example, here are a few excerpts from some of the numerous inquiries received in this office during the past few days:

A fishing-tackle manufacturer writes:

"We are considering seriously of adding a department in the very near future for manufacturing artificial baits made from wood and, of course, would have to resort to finishes, either lacquers or enamels." This concern is interested in "the names of manufacturers supplying lacquers, varnishes and spray guns suitable for this class of work. . . ."

A manufacturer of "Distinctive Advertising Specialties" says: "We are striving to obtain a hard, smooth, glass-like appearance after spraying lacquer, without resorting either to hand polishing or hydraulic pressure between nickeled sheets . . . . We will be very thankful to you for any suggestions as to how or where we may obtain the results we want."

A company in the South asks about, "A tool or mechanical device for striping purposes. We think we recall having seen such an item advertised in INDUSTRIAL FINISHING and would like to have you give us the names of one or two concerns making such a product.

A concern that designs and manufactures fine cabinet work (store, office, bank and drug fixtures) wants to know "the name of the material used for cleaning galvanized iron, as described in the article 'Decorating Electric Signs', in June issue."

A showcase manufacturer wants to know "what materials or methods are most practical in the finishing of fireproofed lumber."

Several concerns have asked for names of manufacturers of true high-solid lacquer, synthetic resin enamels, heat-resisting aluminum finishes, tumbling lacquers, and other materials which were mentioned editorially in July and August issues of INDUSTRIAL FINISHING.

Inquiries and letters from readers are always very welcome, and they receive immediate attention and service, but when answering such inquiries the publisher, in fairness to all concerned, is often obliged to name more than one manufacturer if more than one concern is offering what is wanted by the inquirer. But when what is wanted appears in the advertising pages, the advertiser receives the inquiry directly and exclusively instead of waiting for it to be relayed to him and to others after correspondence between the inquirer and publisher.

Advertising what people want continuously in the publication they read and refer to so much will certainly produce many interesting inquiries and "leads" to profitable business. This applies with equal emphasis to manufacturers in every industry.

W. H. Rohr

Managing Editor

DeVilbiss

Headquarters for Spray-Finishing Equipment for the Finishing Room

On every question pertaining to spray-finishing operations, consult the DeVilbiss man before you make a decision. You can be sure he won't try to sell you anything,—unless you really need it. If a slight adjustment of a spray gun will accomplish the result you want, it is his duty to explain it to you, not to sell you a new spray gun. If, at slight additional cost now, you can save heavier expense later on, it is the obligation of the DeVilbiss man to point that out to you.

The DeVilbiss idea of service is more than a rigid code. It is a sincere desire to serve you honestly and to *your* satisfaction and profit. Your local DeVilbiss representative is as near as your telephone.

THE DEVILBISS COMPANY . TOLEDO, OHIO

NEW YORK PHILADELPHIA CLEVELAND DETROIT INDIANAPOLIS CHICAGO
ST. LOUIS LOS ANGELES SAN FRANCISCO WINDSOR, ONTARIO
Direct sales and service representatives available everywhere

The wide DeVilbiss Line embraces every outfit and accessory for spray-painting and spray-finishing

Finishing 30 Years from Now

By
B. SANDERSON

What changes have occurred and what changes may be expected to take place in wood finishing, metal finishing, and in the equipment for applying finishing materials to the surfaces of industrial products

AS WE LOOK back over the finishing experience of the past 30 years we are impressed by the many changes which have taken place in finishing materials and methods. It is a far cry from present-day finishing methods to the French-polish of 30 years ago when a finish was worked up only after days of laborious rubbing with the shellac pad. There certainly is a marked difference between old carriage-painting systems and present-day automobile finishing processes. Lacquer and other improved materials have opened up new fields for finishers.

What will finishing be like 30 years from now? Only the most self-sufficient of us will venture to say that modern finishing methods and materials have reached the zenith of perfection. What changes then may we anticipate? Let us first consider the woodworking industry.

Wood Finishing

Wood lacquers have very largely supplanted varnish materials in the finishing of wood furniture. The use of lacquer has brought about certain changes in the wood-finishing room, prime among which is speed of production. Second is a new standard of toughness and durability of film, and a third important change is that the rapid set-up of lacquer precludes the danger of its picking up much dust or dirt while drying; hence it is no longer necessary to maintain such scrupulous standards of cleanliness in the finishing room, nor is it necessary to completely isolate the finishing room and go to expensive precautions to prevent the ingress of dust.

These are much desired conditions and they prevent the return of the old type varnish. Nevertheless, present-day lacquers are not ideal because of the cost of lacquer finishes. Lacquer costs more than varnish and does not go as far because (1) it does not cover as many square feet per gallon, and (2) it does not produce the same body on the work. This latter feature is due to the fact that the old type of varnish contained upwards of 50% of solid matter at spraying consistency; whereas, present lacquers contain approximately only 20% solids. Hence, one coat of varnish is equivalent in fullness on the work to almost three coats of lacquer.

Therefore the ideal wood finish of the future must contain approximately the same percentage of solids as the old varnish; have approximately the same set-up as lacquer, and offer the same speed of production.

Far-sighted manufacturers of finishing materials have already realized the need of such a material and are conducting extensive research work to develop such a

product. It may therefore be but a short time before this ideal wood finish makes its appearance and the writer does not hesitate to predict that such a finish will practically supplant the present-day lacquer in furniture finishing.

The growing use of decalcomania in finishing paneling of low-priced radio cabinets will undoubtedly be continued in the future, as attractively figured woods become rarer and more costly. Along this line, processes have been worked out to duplicate walnut and mahogany effects on lower priced woods by employing methods similar to those used in graining metal. In the future this process may be developed to such a stage as to replace the use of expensive veneers.

Metal Finishing

Turning now to metal finishing, there are those who go so far as to predict that present-day methods of coating metals with film-forming materials will be superseded in the future by processes of finishing wherein the metal itself will be altered chemically to produce the desired color. The proponents of this idea point out that if the finish is made actually a part of the metal itself there can be no question as to its adhesion and permanence.

While the notion is rather bizarre and not apt to be fulfilled in the very near future there are certain commercial processes being employed at the present time making use of this same principle.

For instance, take the patented process of bonderizing steel which is being employed in finishing fenders, hoods, etc., by many of the largest motor-car manufacturers. In this method a prime coat is formed by suspending the steel articles in a heated solution of a chemical which changes the surface of the metal to an even-textured, porous, red-colored compound, which makes a perfect surface for japanning or lacquering.

A similar process employs a solution of butter of antimony in an organic solvent to produce a black deposit on galvanized metal. Along this same line, articles of aluminum are now being finished by an electro-plating process which produces vivid colors.

These illustrations indicate that it is not entirely impossible that chemical and electrical methods may change our notions of finishing metal in the future.

Finishing Equipment

Undoubtedly there will be many improvements in mechanical methods of finishing. Conveyor systems, automatic spraying, and automatic handling will play a large part in future finishing operations.

An excellent illustration of the part that mechanical finishing is beginning to take is the method which has recently been developed for finishing plywood flooring.

Here, entirely automatic equipment surfaces the wood blocks, and revolving, automatically-fed brushes apply quick-drying stains. As the conveyor passes on filler is applied and mechanically padded in. After the filler is force-dried, lacquer building-coater is applied by a roller, and force-dried and sanded; then after two coats of finishing lacquer are applied in the same manner and force-dried, the finish is rubbed mechanically. The finished product has now reached the end of the conveyor, completely finished without being touched by a hand.

The sum and substance of this article is that finishing methods and materials are going to keep

on changing. The finisher who continues to use materials and processes that were excellent 20 years ago is going to be left holding the bag. On the other hand, the finisher who keeps abreast of the times, who continually tries new materials and theories will be enabled to produce better finishes more economically.

Finishing Engines

After an experimental era covering centuries, the use of steam, gasoline, crude oil and electricity as motive power is now so widespread on ships, automobiles and in great electrical plants, that this might be fittingly termed, "the engine age." Such an age calls upon the exercise of care in the finishing of these engines so that in appearance as well as performance they will reflect credit upon their builders.

The processes of finishing in the great plants, where the engines are first turned out, are the result of much research work. The application of paint by the spray system is used to good advantage in securing evenness of paint distribution.

Engines should be finished in the plant of the user when they are second hand or when usage has rendered them less attractive than they should be, for the mere fact that an engine is second hand is no indication that it should never be treated to a coat of paint, so that when the second owner comes into possession of said engine he will have something for which no apologies need be offered.

In finishing engines it is well to bear in mind that oil-and-gas proof enamels or paint should be used. A glossy black enamel that dries quickly—say in two hours, and dries hard in 24 hours—is used by some concerns. Others prefer a gloss black that covers well in one coat over a good primer or undercoat or iron filler. The same thing is true as to the finish on electric motors.

The black engine is not an exclusive find on the market today. There are engines in gray, green red, and even yellow. The "battleship gray" is used by a large number of engine and machinery manufacturers.—S. Curtis.

W. H. McCartney Joins Eureka

Mr. W. H. McCartney is now associated with an old friend, Mr. A. W. Smart, president of the Eureka Pneumatic Spray Co., 124 White St., New York City. Mr. McCartney was formerly active in the development and sale of lacquer for industrial uses.

Hercules Chemists End Research in Germany

Three Hercules Powder Co. research chemists have returned from Germany to the company's headquarters at Wilmington, Dela., within the past few weeks. They are Dr. E. J. Lorand, Dr. H. M. Spurlin, and Dr. Kyle Ward, Jr.

The higher fatty acid esters of starch and cellulose, osmotic pressure measurements of cellulose solutions, and new methods of degradation of cellulose have been the main research problems undertaken by the Hercules representatives.

Reports Business Improvement

Mr. V. J. Dolan of V. J. Dolan & Co., Inc., 1830 N. Laramie Ave., Chicago, has just returned from a trip through several of the central states and reports a very material improvement of conditions in many sections. He states that there is ample evidence to warrant a genuine feeling of optimism as the activities represent widely varied lines from novelty furniture to case goods, chairs, radios, etc. It is believed that this fall will find many plants operating to capacity and showing good earnings. Many new and attractive designs and finishes are in production and meeting heavy demand.

Painting and Finishing Railway Rolling Stock

By
E. PERRY

"Beginning a series of articles devoted to current practice in the maintenance and care of painted and varnished work at terminals, paint shop equipment as installed in the newer and larger shops, in fact the whole line-up in sandblasting and metal cleaning, painting and stenciling, covering both new and old work on passenger and freight rolling stock"

A FEW YEARS ago a committee of the equipment painting section of the American Railway Association recommended that freight and passenger engines should be cleaned before every trip; also that the front ends should receive a suitable coating. Passenger engines should be repainted every nine months, freight engines every 12 months, and switch engines every 15 months. At that same time it was the judgment of the committee that the railroads do not, generally, take into consideration the importance of painting for the preservation and conservation of their freight equipment.

Ordinarily, railroad rolling stock is subject to maximum abuse with least possible repairs; it is kept constantly on the job as long as it will run, or until it is wrecked, and oftentimes it must be repaired at an outside point, patched up and put into service again. In consequence of this, freight equipment rarely receives painting under a few years. The question naturally arises—is this economy? From the painters' standpoint, it is not; but from the management's it may be, as evidently they have considered these problems from every angle. In view of this situation it was advised as most necessary that equipment should be painted properly when first sent out new from the shop.

Sandblasting

The master painter now considers it most important to sandblast steel equipment, whether old or new, before painting; then immediately prime with an approved standard metal-protective paint. For open top cars the prime coat may be followed with two coats of carbon black; on steel box cars, after sandblasting and priming, apply two coats of oxide of iron thinned to proper brushing or spraying consistency with two-thirds boiled linseed oil and one-third of a proprietary thinning oil of good grade, commonly termed "paint oil" or "japan oil." All steel underframes should be sandblasted and coated with a good metal primer, followed with at least one coat of standard body color.

Steel or galvanized iron roofs should be suitably primed, and followed with two coats of a durable roof paint. On new box cars the interior of all steel plates, posts, braces, etc., should be

painted with a good priming paint and one coat of finishing paint as approved. In this connection it was advised that where metal overlaps, or is joined on all new cars, a good heavy red lead or equally satisfactory metal protective paint should be applied.

Further, for new wooden equipment the following recommendations were advised: all steel underframes should receive the same treatment as for steel cars; the outside of sheathing, and all sides of roof boards and saddles, should be primed with oxide of iron and boiled linseed oil before being assembled into the new car, after which two coats of good paint should be applied, thinning same as previously given for steel cars. Roofs, if wood, should receive the same treatment as the body of the car; if metal, the same treatment as on steel equipment. In the maintenance of old equipment, all new sections should receive three coats of paint, and old work two coats. Underframes of old equipment should receive one coat of standard body color; and roofs two coats of standard roof paint.

Galvanized Surfaces

Owing to the necessity of getting this equipment back into service again with dispatch, the repainting should be done by spraying. While climatic conditions on certain railroads may require some change in the outer coatings, the above is still good general painting practice. There are, however, three specific changes from the foregoing recommendations, in current methods, viz: it is no longer necessary to sandblast galvanized iron used for roofs, prior to painting, as there are special paints on the market which adhere tenaciously to galvanized coatings without pre-treatment of the surface; the other advancement is in the rather recent development of quick-drying freight car paints and similar coatings for railroad finishing exterior and interior, in place of the slower drying materials, especially those paints already mentioned as made with boiled linseed oil.

Regarding the former, it has been well known that paints are very apt to peel from galvanized iron on account of the smooth spangled surfaces which are presented. Heretofore this condition has been obviated by first treating the metal before painting with various chemical oxidizing solutions—mainly, the salts of copper; by etching the surface with acid solutions; by sandblasting the metal as has been quite usual custom in railroad shops; and by using special paint primers supposedly more adherent than regular types of paint, but which generally are of more or less doubtful efficacy.

The main difficulty in this last field has been that the priming material has not secured any real anchorage in the metal surface, consequently when the film has reached a certain degree of oxidation its bond could be readily loosened by stress of any kind—frequently by contraction of finishing coats of paint applied over it; and then the entire thickness of coating has separated from the metal itself. The only character of priming coat I have known to be invariably successful under practically all conditions of painting galvanized iron, is a special brand of Portland cement paint specifically for painting metal surfaces—galvanized or black iron.

This particular product contains Portland cement combined with other pigments, and undoubtedly

utilizes a specially prepared oil vehicle because the resultant paint coating dries so hard as to seemingly carry all the virtues of cement and yet retains a high degree of elasticity. This paint may be applied to ordinary galvanized iron sheet metal untreated in any way; after drying, the metal may be bent double without any evidence of a crack or fracture in the film of paint. The iron may be broken in two by repeated bendings back and forth, but still the paint film will not crack. The galvanizing itself will finally crack and peel at the fracture without the paint coating separating from it.

This paint should be applied to new galvanized iron without chemically pre-treating the metal or altering its natural surface in any manner. Firm adhesion of the film is secured primarily from the etching action of the alkaline Portland cement on the metal, effecting an amalgamation (it might be erroneously termed) between the paint and the metal.

In regard to the quick-drying finishes alluded to, these have been tried on railroad work so comparatively recent that it is still a little premature to judge how they will eventually hold up under continual severe service conditions. This applies to both passenger and freight car finishing. With this type of material a new box car may receive at least two coats of paint on the same day and be stenciled on the day following. With some of these materials, two coats may be applied and stenciling done, in one day. As to the quick-drying varnishes and enamels, it is probably the opinion of railroad master painters so far that these may not prove of equal durability to lacquers. More on this specific phase of the subject will be taken up later, but at this point it is desirable to digress to another topic.

Severe Service

A passenger car undergoes severe changes in temperature, especially in the winter months while standing around in coach yards and terminals. The flaking and peeling of the finish from inside and outside the steel railway coach is a trouble largely due to extremes of expansion and contraction. The linear expansion of steel is 1½ times greater than that of wood, and the vibration and expansion and contraction of thin steel sheets is much greater than with thicker sheets. The steel coach headlining ordinarily is of $\frac{1}{16}$-in. thickness; interior side walls of sheet steel generally come in the same thickness; the sheet steel for the outside panels above the belt rail goes in at $\frac{1}{8}$-in.; and the panels below the belt rail have a thickness of $\frac{3}{16}$-in.

During severe cold weather, prior to the cars being placed in trains, the heat is turned into the cars and thereby the finish gets a severe shock. This may be repeated many days in succession, and constitutes a violent strain on the finish applied to the surfaces thus exposed within and without the cars. Even on the outside where the steel is three times the thickness of the headlining steel there have been many instances of the finish scaling off in great sheets right down to the bare metal. Such instances are not uncommon throughout territory where zero conditions prevail insistently, or where the temperature runs from cold to hot without moderation.

Flaking finish is oftentimes associated with newly painted and finished surfaces, some of them

out of the paint shop barely more than a day or two. As a rule, however, this trouble is more likely to be found in the finish considerably worn and in that of old age where the vitality is low and the resources weakened by loss of elasticity. It has been observed that the flaking of the finish from the outside of steel passenger coaches is of greater extent on surfaces of thinner steel than on those of thicker sheets. The condensation of moisture in spaces back of sheet steel, which is found to occur frequently in the construction of steel passenger cars, is a certain source of paint peeling under some conditions, and of rusting steel under practically all conditions.

(To be continued)

Railway Cars Aluminum Painted

The old fashioned "box car red" shade is doomed for extinction as a color for railway refrigerator cars. Recent experiments made in the car shops of the Canadian National Railways show that aluminum paint, applied to the roofs of such cars, is more heat resisting than red. The external temperature of a roof covered with aluminum paint was found to be 10 degrees less.

Further experiments are now being made by the railway, and two new refrigerator cars are being painted entirely with aluminum. Special thermometers in the cars will record the internal temperatures, and a record will be made of the ice consumption as compared with that in cars painted red. Should the aluminum paint prove successful in improving refrigeration, it is very likely that all cars of this type on the Canadian National Railways will eventually be dressed in the newly approved color.—C. N. R.

Worthington Staff Appointments

Recently several important additions have been made to the staff of the Worthington Pump and Machinery Corp., 2 Park Ave., New York City. At the same time, certain organization changes also were announced.

Otto Nonnenbruch, for the past four years chief engineer of the Diesel department of I. P. Morris and De La Vergne, Inc., Philadelphia, Pa., and prior to that with Worthington in various capacities for nine years, rejoined the latter organization as of July 1. Mr. Nonnenbruch will make his headquarters at Buffalo, N. Y., as special sales representative.

J. B. Allen, formerly president of the Allen Engineering Co., Bridgeport, Conn., has been appointed special marine representative with headquarters at Harrison, N. J.

H. G. Wood, formerly assistant manager of the New England division of the Westinghouse Engineering and Mfg. Co., has joined the organization in the capacity of electrical sales engineer.

E. M. Paullin, Jr., has been appointed electrical sales engineer at the Cincinnati, Ohio, Works. Mr. Paullin was formerly associated with the New York office of the General Electric Co. as synchronous motor specialist.

John T. Clancy, assistant manager, Buffalo Works sales division, has transferred his headquarters from Buffalo to Harrison, N. J.

E. W. Hammond, formerly located at Buffalo, has been transferred to Los Angeles as special representative of Diesel and gas engine sales on the Pacific Coast.

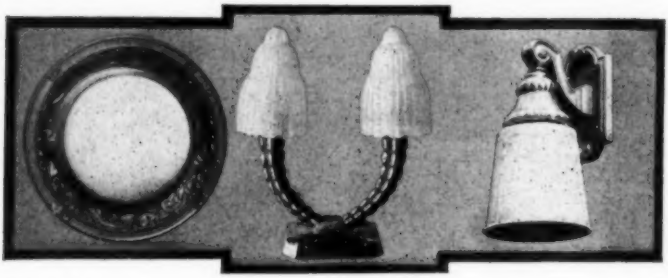
A. M. Boehm goes to Kansas City as Diesel and gas engine specialist. He formerly was in the sales department at Buffalo Works.

Joseph F. Hecking, formerly with the Diesel engine sales division in New York, has been assigned to the Diesel and gas engine sales division at Buffalo.

William J. Daly, assistant manager, Cincinnati Works sales division, has been assigned to Pittsburgh, Pa., on special sales work.

G. A. Herrmann, formerly sales engineer at Chicago, has been appointed acting district manager at St. Paul.

W. R. Kennedy, sales engineer at Pittsburgh, has been appointed acting district manager at Kansas City.



Finishing

Electric Light Fixtures

By
A. L. MEDEL

There are three types of lighting fixtures: chandeliers for buildings and homes, fixtures for railroad passenger cars, and steamship fixtures; all of these have a separate means of finishing—that is, finishes best suited to stand up under surrounding conditions

THE FIXTURE manufacturer has a set of colors as his standard. These standard colors may be different from what another manufacturer uses; some concerns have 12 colors, some 24, others have even more. Usually several fixtures are finished with different colors or finishes and placed in a show room where customers may choose from the various designs and finishes.

Referring to the three different fixtures illustrated at the top of this page the center fixture (at left) was photographed so as to show how it looks in the railway car—looking up at it from the floor of the car. This fixture is finished in an acid finish on polished bronze.

The table lamp (center) is used on a dining table and is finished in old silver finish.

The bracket fixture (at right) is finished in an acid finish. Note how strongly it is made. The shade on this fixture is a transilux shade made from moulding powder at our plant.

The photographs from which these cuts were made are furnished through the courtesy of the Safety Car Heating and Lighting Co., 75 West St., New York City.

Jap gold finish has a big part in chandelier fixtures. In this color they are first buffed on all the high spots to produce artistic highlights, the metal being brass or brass plated, as a lot of die castings are used in chandelier work. After being high-lighted the fixtures are cleaned and sprayed with Jap gold powder, and while still wet the parts that were buffed are wiped. When dry they are given a coat of clear lacquer over the entire surface.

Brush brass is buffed on a 12-in. diameter tampico wheel, with a composition which is adopted by the company making the finish. Some use emery cake and oil; some use a greaseless compound; others make their own compound. After being brushed they are washed out and lacquered.

Old English brass is first bright dipped and then plated in a black nickel or arsenic black solution

Heritage . . .

▲ ▲ Our 48 years as leader of the lacquer industry place upon us a responsibility which present conditions accentuate.

Business cycles and temporary depressions are merely a part of our lifetime. We successfully passed through the dark days of 1893, 1907 and 1921. Each of these major depressions taught us lessons which, today, are priceless. We recognize, that only perseverance, honesty of purpose, and integrity of product can successfully weather the storm.

To our friends now, as in the troublesome days of the past, we offer our facilities and fullest cooperation.

ZAPON

ZAPON

PYROXYLIN LACQUER

▼

THE ZAPON COMPANY

A Division of Atlas Powder Company

STAMFORD CONNECTICUT

and relieved with the same process that is used in making brush brass, only the black is left in the recess or removed wherever the brass is to show; then the surfaces are cleaned and lacquered.

Silver and gold make many attractive finishes on chandeliers; several shades of gold can be obtained. Silver can be oxidized in several ways to make very pleasing finishes.

Bronze powders are also used a great deal on chandeliers, and with the aid of a little paint or colored lacquer enamel many pleasing tones can be made.

Steamship fixtures are mostly finished in colors that will stand sea air; most fixtures have an acid-stain finish.

Railroad fixtures are made stronger than the other fixtures. They are made mostly from castings of brass, bronze and aluminum metal. The finishes used on this type of fixture must stand up well under air conditions in the railroad yards and on the road, as coal, gas and smoke will harm a lot of finishes.

Finishes that endure and appear attractive for a long time under these conditions are the acid stained on sandblasted brass or bronze metal. The fixtures are first sandblasted; then stained in a sulphide of potassium solution made up in the proportion of 1-lb. of the chemical to 30 gallons of water heated to 120° F. Next, they are dipped in a toning solution made up by adding one gallon of sulphuric acid to 30 gallons of water. Each dip in these solutions means a different color—a darker shade. Attractive bronze colors can be made on brass or on bronze metal; using the same solution, light reds and darker to blue black can be made. Very attractive browns can be obtained with solutions made up as follows, using the same toning solution:

Potassium sulphate	2-oz.
Barium sulphide	4-oz.
Aqua ammonia	8-oz.

After the fixtures are given the required number of dips to get a certain shade, they are dried in sawdust and brushed with a brass wire scratch brush to bring out a uniform color; then they are coated with a good grade of matt lacquer.

Since so many railroads are being electrified and thus getting away from smoke and coal gas, it is becoming the custom to finish the fixtures in a more delicate color, using lacquer enamel to match the deck of the car.

The chief problem in finishing railroad fixtures is due to the fact that there are so many different colors that have to be matched for certain railroads. Sometimes the factory making the fixtures has to match the hardware in the car, or the hardware man has to match the fixtures, but most of the time the fixture man is "the goat"; so you see what makes railroad fixture finishing so difficult.

After the samples are matched, the finish is passed by the inspection department which then holds the master plate. We have over 600 different colors of acid, enamel and polished finishes.

There are so many finishes that it would take considerable time to write about them all, but if there is any finish the reader would like to know about, just write to me in care of INDUSTRIAL FINISHING magazine, and if it is in my power I will do my best to explain all I know about that particular finish you have in mind.

IMPERVIOUS

"IVCO" LACQUER, VARNISH and ENAMEL

Registered U. S. Patent Office

ENAMELS · IMPERVIOUS · TRADE IVCO MARK · PRODUCTS · LACQUERS · VARNISHES

Trademark No. 276989

IMPERVIOUS Lacquer, Varnishes and Protective Paints are Quality Products

Manufactured By

IMPERVIOUS VARNISH COMPANY

General Office: Koppers Building PITTSBURGH, PA.

Factory and Varnish Plant ROCHESTER, PA.

No Branch Factories

Toy Finishing Methods

By
E. W. WINDSOR*

Describing practical and economical methods of finishing toys of various sizes and shapes in wood, sheet metal, cast metal, hard rubber and composition—by dipping, tumbling, and spraying

THE QUALITY and attractiveness of finish on toys has more to do with their salability than any other one factor. This statement is subscribed to unanimously by the larger toy jobbers. The problem, therefore, of quality and efficient finishing is paramount with toy manufacturers.

Producers who are, from time to time, increasing their line of goods with toys of different types and materials find the finishing problem becomes increasingly difficult. It should then be interesting as well as profitable to study the following finishing methods which have proved to be practicable, efficient, and productive of quality surfaces.

Lacquer, Ideal Material

Lacquer is the ideal toy finishing material; being a quick-drying product, it is exceptionally well adapted for use in all production shops. As most toys are assembled after the separate pieces have been finished, lacquer is especially suitable because there is so little danger of damage to the finish in transporting parts, and in the various processes of assembling.

There are probably no other manufactured articles that have to stand the abuse to which toys are put. The toughness and durability of lacquers fill these requirements.

* Technical man with Sherwin-Williams Co.

Different Surfaces Encountered

The variety of toys manufactured is almost endless and practically every surface which is encountered in industry as a whole is found in this business. From the standpoint of the finishing foreman, it is not so much the kind of toy manufactured that he is interested in, as the pieces of wood or metal, the size and shape, and the use to which it is put. To discuss finishing from this angle, I will make the following classification and then discuss each in turn:

A—Wooden

1. Small turnings
2. Large turnings
3. Angular or irregular wooden pieces.

B—Metal

1. Sheet metal
   (a) Black iron
   (b) Tin
   (c) Hot-rolled sheet steel
   (d) Cold-rolled sheet steel
2. Cast metal
   (a) iron

C—Rubber Composition

D—Sawdust Composition

A—1: First-coat wooden turnings (small) oil-type primary coat. The most economical way to apply the first coat to small wooden turnings is by tumbling. Many shops could cut costs considerably if the tumbling method were adopted. Lacquers, on account of their quick-drying properties, cannot be applied by this method. Oil-type enamels, properly reduced, are most satisfactory for this step.

. . . try *THIS* on your finish

Pour on a little alcohol—light it—let it burn out. *Is there any blemish?*

No marks are left on Thresher's new outstanding finish for wood or metal—*new* in quality—*new* in advantages—of superior lustre, durability and appearance.

You should let us tell you more about this *new* Thresher finish which will give *your product* pre-eminent advantages—which means ready sales.

THRESHER'S High Standard Varnishes MADE GOOD SINCE 1859

THRESHER

VARNISH · ENAMEL · LACQUER

1150 E. Monument Ave., Dayton, Ohio

MAIL THIS COUPON

THRESHER VARNISH CO. Dayton, Ohio

Please send full information, without obligation, of your new finish.

Name .....

Address .....

Casein fillers are also in common use.

The most important factors to be watched in this type of finishing are to have the paint sufficiently thin to allow as perfect an intermingling as possible between the articles and the coating material, and to regulate the speed of the mixer so it will be fast enough to prevent the pieces sticking together.

By forced drying of the first coat to 200° F. for one hour the disfigurement of the surface, due to the formation of bubbles where the subsequent coat is dipped, is overcome.

Second Coat, Dipped

As this process is more likely to raise the first coat than spraying (if an oil-base material is used) care must be taken to have the first coat thoroughly dried.

The pieces are dipped singly, in groups, or by machine. Only special toys which are not made in a production way are dipped singly. The next best method is to dip in groups. Where it is feasible, a hole is punched in the end of the turning so that it can be stuck on a rack fitted with nails. In this way a number of pieces can be dipped at once. This operation is done by hand.

The dip tank should have as small an opening as possible in order that evaporation of the lacquer solvents may be reduced to a minimum. The maintenance of uniform viscosity or body is essential in dipping. When the proper body has been ascertained by trial, this can be readily maintained by the use of a hydrometer. The tank should be tested at frequent intervals, and as it bodies up more thinner should be added to make up for the loss in evaporation. If the wood is very absorptive the material which drains off will have a greater percentage of pigment and be shorter than the original lacquer enamel. If the pigment particles seem to stick together, leaving a rough finish, this may be overcome by adding a small portion of clear lacquer, and mixing it well.

Speed of Dipping

The speed of dipping plays a more important part in securing a good job when using lacquer than it does with oil enamels. Because the lacquer sets up rapidly, if the piece is withdrawn quickly, a heavy coating is deposited as it dries before it has a chance to flow off. A bothersome feature is the formation of a tip due to the accumulation of excess material at the bottom. If the articles are turned upside down after draining for a carefully determined time, this will flow out. If this is done too soon, the lacquer will flow back, particularly on the sides, and runs will occur. If too late, the tip will have set up and will not flow out.

By dipping slowly the lacquer has a chance to flow down as the article is being removed, a thinner film is applied, and the danger of runs is minimized. While some articles are dipped satisfactorily by hand, modern production methods call for special automatic machinery. The automatic machine is designed for the purpose of automatically dipping all kinds of small wooden and metal items at the least possible cost. They have a capacity for finishing from 2,500 to 100,000 small items per day, depending upon the size and shape of the article being dipped, the operator, and the quality of finish being used.

A flat finish can be dipped faster than a gloss.

Unless you have *used* these materials you can have no idea what they can do for you in your work.

There is only one way to learn about the astonishing qualities of Murphy Flexible Lacquers as compared to nitrocellulose lacquers or varnishes — and that is to actually *use* them in your own shop, or let us demonstrate them to you.

Wood or metal surfaces are better finished with these lacquers—a special grade for each use, clear or pigmented. Murphy Flexible Lacquers wear twice the time of ordinary lacquers.

Astonishing claims have been made for our Flexible Lacquers by hundreds of customers who have used these materials in many ways.

Murphy Flexible Lacquers are very superior in several other important aspects — production, labor, and finish. Get in a small supply and try them out, or write to us for a demonstration.

MURPHY VARNISH COMPANY
Newark Chicago San Francisco

ESSEX VARNISH COMPANY, Newark
(Associate Company)

Baking Material Specialists

Murphy Flexible Lacquers

The cost of an automatic dipping machine runs between $500 and $600. The manufacturers of these machines will develop the proper rate of dipping and will also correctly finish the first batch of samples.

The rate of dip is dependent upon the size and shape of the product being dipped; generally it averages 5-in. per minute. Small wooden handles are usually withdrawn from the lacquer tanks at the rate of 1-in. to 4-in. per minute. A perfect dipping operation covers solidly with no runs or sags.

In most cases these two operations complete the finishing schedule, although where an extremely high gloss is required, a third coat of clear lacquer is dipped.

Wood Finishing

A—2: First coat wooden turnings (large). Tumbling cannot be used to advantage when the turnings are more than 8-in. at the longest dimension. For the first coat the lacquer primer is dipped, or in some cases sprayed.

If forced drying is used, the finishing time can be reduced. Many plants that had installed ovens for baking enamels are using them to advantage in the application of lacquer. The temperature should not be in excess of 125° F. for forced air drying.

Second coat: The method of application of the second coat depends upon the size of the article. When over 18-in. they are usually sprayed. As dipping is cheaper, it is used wherever feasible. If the dipping process is used a standard "body" should be maintained by the use of the hydrometer or viscosimeter.

A—3: Angular or irregular wooden pieces. There are so many grades used that no definite rule for application can be laid down. Whether the dip or spray method is used depends upon the size and shape of the article.

Metal Finishing

B—Metal: The preparation of the metal surface is of extreme importance. No matter what quality finishing materials are used, unsatisfactory results will occur unless the utmost care is taken in the treatment of the metal surface.

B—1: Sheet metal. (a) Due to the speed with which rust forms on this metal it is at best dangerous to use. Great care should be taken in cleaning and after handling, and not more than a few hours allowed between cleaning and final finishing. An oil primer should be used rather than a lacquer primer, followed by one or two coats of lacquer enamel. In most cases the finish is applied by spray, but if the shape permits, dipping is less expensive.

Metal—1 (b) Tin. This material has fallen into disuse by toy manufacturers. Because of its smooth surface the difficulty of getting the finish to adhere properly is very great. Train tracks are made of this metal and the switches are often painted for this purpose with a long-oil enamel.

Metal—1(c) Hot-rolled sheet metal. When delivered this metal is covered with grease and often it is rusted in spots. There are many methods used for cleaning it. The old method was to use a caustic solution, but this has in many cases been replaced by processes wherein a commercial cleaner is employed. The equipment usually consists of three baths; the first is a hot cleaning solution into which the sheets are

You really *Don't Need to Fret* over finishes

THE finishing business is full of "ifs," "ands," and "buts." Step outside what you know and are used to—and, unless you have dependable counsel, you're sunk.

Yet the patience and skill of men of broader experience produce innovations that are often startling successes. Sales curves swing upward. Competitors are taken unawares.

Save time—and money—and trouble—by *using* these men who know finishes. The Egyptian Lacquer laboratory-trained technician can cut through many of your puzzles—suggest quicker, less expensive processes to get better results. Egyptian Lacquers have licked so many finishing and even sales problems, that it's become a habit. We'll be glad to tackle yours. *No obligation.*

In the phone books of the following cities, the Egyptian representative is listed under "Egyptian Lacquer." Call him in to advise about better-selling, better-wearing finishes!

ATLANTA	KANSAS CITY
BOSTON	LOS ANGELES
BUFFALO	PHILADELPHIA
CHICAGO	PITTSBURGH
CINCINNATI	PORTLAND, ORE.
CLEVELAND	SAN FRANCISCO
DALLAS	SEATTLE
DETROIT	SPOKANE
	ST. LOUIS

FREE—New book of Industrial Finishes in COLOR! *"Egyptian Lacquer Enamels" contains color chips of 48 standard shades—just a fraction of the colors you can have if you wish—but the latest and most generally popular tints for industrial use.* **SEND FOR IT!**

THE EGYPTIAN LACQUER MFG. CO.
90 WEST STREET · NEW YORK CITY

dipped; the second is cold running water, and the third is boiling water. After being removed from the third, the sheets are dried in an oven. These should not be left more than overnight before coating. They are generally finished with one coat of oil metal primer and one coat of lacquer enamel.

An alternative method consists of using lacquer primer, which is satisfactory providing great care is taken in removing every trace of rust and grease from the surface. This is smoother than the hot-rolled steel, which makes a better finish possible, but it is harder to get proper adherence. The same method for cleaning and finishing is to be used for this metal as specified for hot-rolled sheet steel.

B—2: Cast metal. (a) Iron: Cast iron engines, automobiles, and similar irregularly shaped articles provide the bulk of this classification. They are generally cleaned by dumping them into a mesh basket and then dipping them into a cleaning solution. Up to the present time color varnishes give the best results, as it is generally necessary in one coat to provide a smooth, well covered finish that does not leave any drain at the bottom when dipped.

For Composition Finish

C—Rubber composition: Some boats, for example, are made from molded hard rubber composition. The only precaution necessary for finishing this material is to give it a light sanding. Often some portions of the surface will have quite a glaze and it is this part, in particular, that should be given a "tooth" for the succeeding coats.

When this precaution has been taken, lacquer enamels can quite successfully be applied direct without the use of a primer. As most of these boats are made in two-tone effects, generally shields are made which are on hinges, divided in the center into which the boat fits up to the desired level.

D—Sawdust composition: Doll heads; arms. These are molded from a mixture of sawdust, starch, and glue, which is baked, leaving a very porous surface.

First Coat: The head is dipped into a sealer of the following approximate formula:

Glue	100-lbs.
Zinc oxide	30-lbs.
Glycerine	20-lbs.

This is reduced to the proper consistency with water.

Second coat: The cheeks and tip of chin are spotted with an aniline dye solution.

Third coat: One coat of flesh colored lacquer enamel. The solvents in the enamel dissolve the aniline dye which bleeds through the top coat, giving the natural bloom of the cheek. The requirements of such an enamel are that it should cover solidly in one coat, have a velvet finish, and natural flesh color. Then, as the doll heads are exposed in shop windows, this finish should also hold its color without showing traces of "sunburn" when exposed to the sun.

Fourth Coat: Tan enamel is sprayed on the top of the head to represent the hair. For the eyebrows stencil marks are made and the eyebrows are sprayed on.

True, this article does not cover every conceivable finishing requirement used in the toy manufacturing industry; however, I will be glad to discuss other methods and surfaces to be finished if written in care of the INDUSTRIAL FINISHING Magazine.

WHY

Du-Pros Pure Shellac is the most economical sealer and first coater

Pure shellac has a greater solids content than other materials commonly used as first coaters. This means that a larger proportion of the finish stays on the surface and less evaporates. Pure shellac produces a heavier film, or if reduced with alcohol, it covers a larger surface per gallon without sacrificing build. At today's extremely low prices, pure shellac costs far less per square foot of film surface.

Every finisher knows the quality film that pure shellac produces. And most finishers will tell you there is no finer or purer shellac than the Du-Pros brand.

If your finish does not contain at least one coat of pure shellac, investigate Du-Pros Strictly Pure Shellac without delay.

JAMES B. DAY & CO.
CHICAGO

Shellac, Lacquer, Enamel, Stain, Etc.

Wood Fillers and How to Use Them—II

By
C. D. YOUNGS

The purpose of filling, what ingredients should be included in good fillers, how to use fillers effectively and economically, and where to find the causes of many puzzling troubles that occur in modern wood finishing

THE WRONG type of filler, improper handling, carelessness in surface preparation—all will result in troubles which are in many instances laid to everything else but the filler coat. Many a lacquer or varnish product has borne the blame for which the filler was rightly responsible, yet if the extreme importance of this operation is fully realized, and its proper relationship to following coats is borne in mind, most of these troubles may be avoided.

Pinholes

There are several reasons for this condition which has the appearance of small pin pricks in the finished surface. The most common cause is the lack of the filler reaching the bottom of the pores. Many times a finisher who is pressed for time will trust to his wiping operation to press the filler down firmly, rather than working it in thoroughly with a brush.

This trouble is also frequently caused by dust from sanding remaining in the pores, thus preventing the filler from reaching the bottom. It is also caused by using a filler that has had too great a reduction, or the filler coat may have been too lightly applied.

Rushing the filling operation to "save time" is more than likely to result in improperly filled pores.

Slowness in Drying

The average filler used (excluding the newer types which dry in from ½ to 4 hours) requires from 36 to 48 hours to air dry in normal temperatures, and under forced drying, from 16 to 18 hours, if best results are to be secured. Yet trouble is often encountered where a filler is even slower than this in drying. In this case the room temperature should be looked into, for anything under 70° F. will slow up the drying.

If it is impracticable because of physical plant reasons to increase the temperature of the room, this handicap may be offset to some degree by the addition of a small amount of japan drier to the batch when mixed, yet this is not to be recommended unless great care is exercised, for adding driers to manufactured finishing materials is apt to either burn them up or throw the whole formula out of balance. All driers do not work satisfactorily with fillers, so one should be procured which is recommended by the maker as a filler japan. In any case, not over ½-pint to the gallon should be used.

Another cause of slow drying is the use of an improper reducer. If this contains any grease content, it will slow up drying, or make it totally impossible if too much is present.

What's this talk about "Drying Time"?

"*Lac*" *asks:* "Just how does drying time affect your finishing schedule? Is drying time the important thing or is quality of finish the important thing? Where is your balance between the two?"

Rapidly evaporating solvents give porous films. The slower evaporation of PENTASOL and PENT-ACETATE aids in giving non-porous glossy films.

And remember the purity of PENTASOL and PENT-ACETATE insures *clean* and *complete* evaporation in a reasonable time.

Save money through improved finish by specifying lacquers whose thinners are *properly formulated* with

PENTASOL AND PENT-ACETATE

PENTASOL and PENT-ACETATE when properly formulated will assure you of non-porous, glossy film—free from blisters and bubbles.

SHARPLES TRADE MARK SOLVENTS

The SHARPLES SOLVENTS *Corp.*
2304 WESTMORELAND ST., PHILADELPHIA
548B RAILWAY EXCHANGE BLDG., CHICAGO
501A FIFTH AVENUE, NEW YORK CITY

Still another reason for this trouble is the use of a cheap unsuitable oil, such as fish oil, in the filler when it is manufactured. Pure raw linseed oil, or better still, refined varnish maker's oil should be used. It is also important that a good suitable grade of japan drier be incorporated in the product when manufactured; otherwise this trouble will occur.

Gray Pores

When lacquer is used over a filler that has not entirely dried, the lacquer solvents will cause bleeding, and so-called gray pores will result. This may also be caused by the filler being too short in oil.

At times the wrong type of coloring matter is used and the lacquer, being a heavy solvent, causes the filler to "muddy up." Then again, this trouble is sometimes caused by the size coat being applied before the stain is totally dry, in which case the filler fails to dry to the bottom of the pores.

Other Troubles

One case of trouble was traced to the following condition. Filler was not sinking into the pores of veneered cabinets. It was found that the surface had been wet-sponged with warm water in order to avoid any trouble from the glue on the surface, and the filler had been applied before the wood was entirely dry. The wet sponging closed the pores (swelled the wood) so the filler could not penetrate, yet when the filler dried, the pores opened up and the finish coat sank into them instead of covering the surface evenly.

As suggested previously the use of an improper type of coloring matter in the filler will cause trouble, and some jobs have shown a muddied or faded color to the filler under the lacquer coats. This is caused by the fact that lacquer, being composed of strong solvents, must naturally act as a solvent on both spirit and oil-soluble colors. The remedy for this is to use fillers especially made for use under lacquers.

The advent of nitrocellulose lacquers has caused a revolution in the use of fillers, but many firms who have discarded varnish and oleoresinous products in favor of lacquer are still using the same type of filler they formerly used. In some cases this has worked out satisfactorily but in many others trouble has occurred. Yet even though good results have been secured it is safer from an operating standpoint to use materials especially made for lacquer than otherwise.

The filler is the foundation coat and all others depend upon it, therefore it should be as nearly perfect as possible.

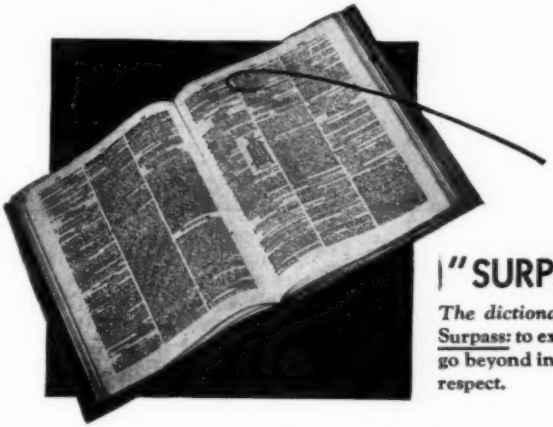
Du Pont Oil Colors

The Paint & Varnish Division of the du Pont Co. announces that in the future all its oil colors will be marketed under the name of Du Pont Harrison Oil Colors and under the black label. All other oil color lines will be eliminated.

Guyer of DeVilbiss Returns from West

R. A. Guyer, sales manager of the Paint Spray Division of The DeVilbiss Co., Toledo, Ohio, has just returned from an extensive trip throughout the Middle West.

On this trip, Mr. Guyer called on DeVilbiss salesmen, distributors and customers for the purpose of ascertaining true conditions in the field. He was accompanied by R. G. Petersen, who is in charge of the Middle Western District. Upon his return, Mr. Guyer stated that he found conditions throughout the Middle West in an improved state and the outlook much brighter than for many months.



"SURPASS"

The dictionary says:
Surpass: to exceed; excel; go beyond in any way or respect.

LINGERWETT REMOVER

surpasses in performance and sales . . . . . *. . . . the most popular remover in America*

You can trust the *users* of a product to know how good it is, and when they buy more of that product than of any other, you can be pretty sure that they are right in their judgment.

The fact is that Lingerwett definitely *excels* as a remover of paint, varnish, enamel, shellac, and lacquer whether from wood, metal or any painted surface.

Lingerwett is not just another remover, nor merely just a little better. It is noticeably superior. Count the number of coats it goes through . . . . . 5, 10, 15 coats or more. Count the number of applications . . . rarely more than one. Check the speed . . . how much more quickly Lingerwett works.

And — most important of all — notice how, instead of a gummy, clinging mess that is so exasperating to handle, Lingerwett reduces the surface to a soft, loose sludge that is easily wiped out.

Just try Lingerwett once, that's all you need to do to realize that it's the remover you will use thereafter. We are so sure of Lingerwett and what you will think of it that we can afford to send you a generous size sample can entirely free. The coupon is for your convenience.

THE WILSON-IMPERIAL CO.
Newark, N. J.
FREE TRIAL OFFER

The Wilson-Imperial Company
115 Chestnut St., Newark, N. J.
Please send me a free trial can of Lingerwett Remover.

Name .....
Street .....
Town .....
I. F.-9-31
State .....

New Materials and Equipment

Presenting briefly, certain outstanding features of new or improved materials, supplies and equipment which have been developed and made available for use in modern industrial finishing departments

New Lacquer Stain

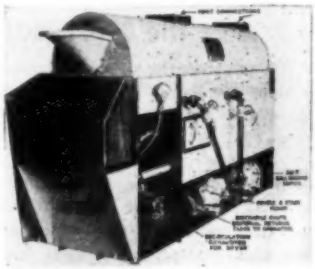
V. J. Dolan & Co., Inc., 1830 N. Laramie Ave., Chicago, Ill., has recently developed a new material for spray staining and sealing in one operation. This new product is known as Wateroil Lacquer Stain—a non-grain raising or wateroil stain of a lacquer content that serves as a sealer as well as a stain. The resultant effect of this combination is to prevent absorption by the wood of successive coats applied over the lacquer-base wateroil stain.

This type of stain is better adapted to spraying than dipping or brushing, but it permits shading as well as staining and sealing in one operation.

Cleaning and Drying Machine

A new, completely automatic, washing, rinsing and drying machine which stands out as a distinct advance in modernized cleaning equipment has been developed by the Metalwash Machinery Co., Inc., 117 E. 24th St., New York City. It is a powerful rotary drum type machine combining three distinct functions in one small compact unit, easily removing grit, dirt, oil, foreign liquids and chips from screw machine parts, stampings, small castings, etc. It is used before or after plating, burnishing, acid dipping and cleaning before paint finishing or between various factory operations.

This Metalwash machine operates on a rotating principle. Only one operator is required who dumps the work into a loading chute. The helical screw in the perforated drum guides the material past the powerful wash and rinse sprays, causing it to be automatically discharged into the dryer drum which returns the clean and dry material close to the loading station where it is automatically discharged into a container and removed by the same operator. If it is desired only to wash and rinse the material, it can be discharged at the end of the rinse section into containers by a specially constructed chute which by-passes it from the dryer drum.



Flexible in operation, so that if desired the machine may be utilized as a separate washing or rinsing or drying machine, or any combination thereof.

Have You Seen
The New Walnut Color?

"SPRUANCE QUALITY"

No. 4883

TUSCANY WALNUT

WATER STAIN POWDER

A new shade of Walnut. A clear, rich, transparent Brown, the correct color and depth of shade for all latest designs in Walnut Furniture. For use on both straight-grained and butt Walnut Veneers.

SEND FOR SAMPLE

Why Not Use an Authentic and Correct Shade on Your Early American Maple Pieces?

"SPRUANCE QUALITY"

No. 4691

EARLY NEW ENGLAND MAPLE

WATER STAIN POWDER

This color is a correct match to genuine Early New England Furniture in a nationally known Museum Collection.

SEND FOR SAMPLE

THE GILBERT SPRUANCE CO.

OFFICES ◆ WORKS ◆ LABORATORIES

Richmond and Tioga Streets

Philadelphia

The size of the machine depends upon the size, weight and character of the metal parts to be cleaned. The standard machine has a rotary drum diameter of 15-in., and has a surprisingly large production capacity, requiring a relatively small floor space. Larger machines are constructed to suit individual requirements.

Metalwash sprays with special nozzles force solution against the work at suitable pressures up to 20-lbs. at the nozzle. The drying system provides for hot air recirculation by a motor-driven exhauster.

The machine is furnished, as desired, complete with motors, pumps, exhauster, operating valves and accessories for drains, waterfill, steam coils, injectors and steam traps. A thermometer is included in the equipment.

Barrett Filwhirl Enameler

The Leon J. Barrett Co., of Worcester, Mass., has recently developed a new centrifugal enameler for enameling, japanning and coating a wide variety of articles made of wood, fiber, or metal, weighing from a fraction of an ounce to several pounds. This newly developed enameler is known as the Barrett Centrifugal Filwhirl Enameler.

The Barrett Company states that the saving in time, evenness of the coating, and freedom from drip and thick spots, together with bulk handling, shows a vast improvement in such operations.

Articles are placed in the container and the coating materials enter the machine through a valve. The parts become immediately and completely coated. Any unused excess is thrown off, leaving only the desired even thickness of covering. Every corner and crevice becomes coated uniformly. Threads in tapped holes do not clog. Lacquering and painting of small articles usually treated by other methods is almost instantaneous. There is no dripping after leaving the machine.

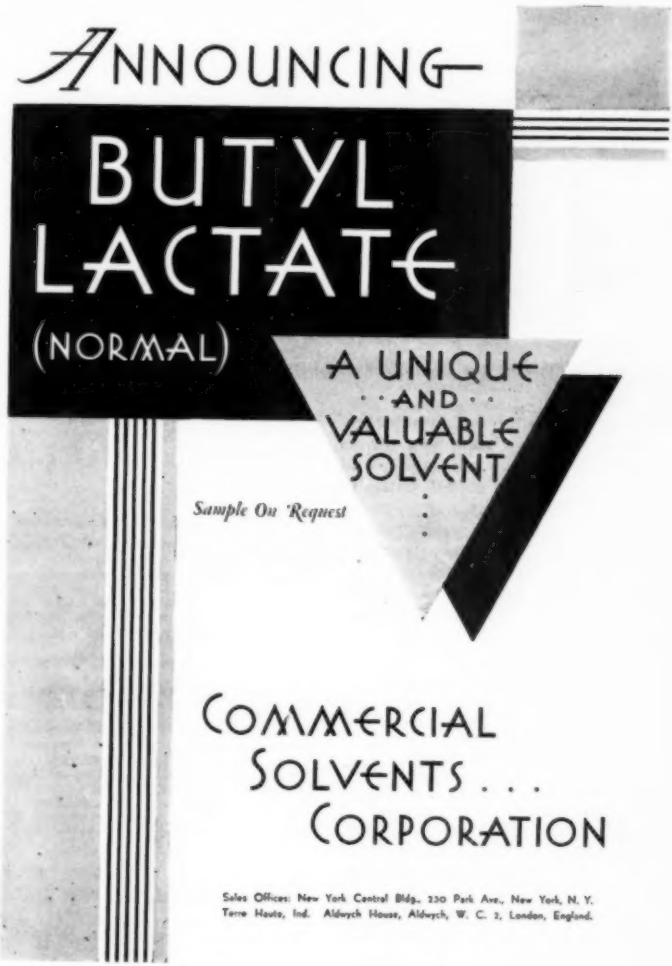
The Barrett Filwhirl enameler has a large hourly capacity and requires only the minimum of floor space. The coating material may be run either hot or cold. Any excess of coating material over that used on the parts is returned to the supply tank, there being no wasted material whatever. Costs are accurately arrived at and with care the most excellent quality of work can be done, although the Barrett Company makes claim only for quick bulk handling.

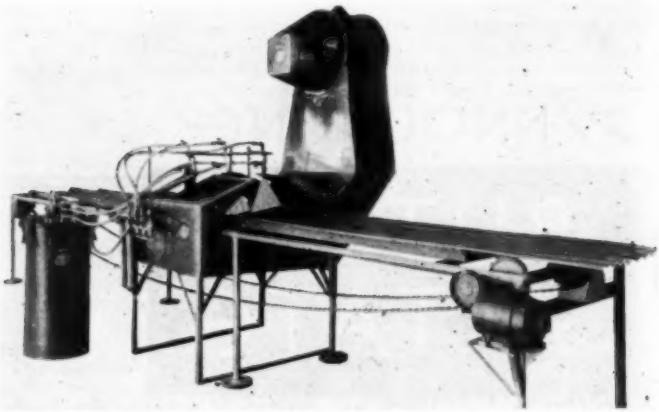
Mechanical Air-Painting

The Paasche Airbrush Co., 1921 Diversey Parkway, Chicago, Ill., announces its Type F 648 20-ft., conveyorized automatic air-painting unit, which will paint or coat any sheet product smoothly and uniformly with any liquid material, light or heavy.

This unit is equipped with three automatic airbrushes that are mounted on universal sliding and revolving arm mountings, facilitating quick and easy adjustment. Three independent air regulators control air pressure for each airbrush to insure correct setting and timing of the spray, thereby providing uniform matching and speed from each gun. These air guns will cover sheets 30-in. to 40-in. wide, at slow or fast speed, up to 80 lineal feet per minute. The guns can be turned off or on at will by means of a hand or foot control lever.

A 32-gallon "clamptight-cover" pressure tank with air motor agitator, air regulator and triple


ANNOUNCING
BUTYL LACTATE
(NORMAL)
A UNIQUE
AND
VALUABLE
SOLVENT
Sample On Request
COMMERCIAL SOLVENTS . . . CORPORATION
Sales Offices: New York Central Bldg., 230 Park Ave., New York, N. Y.
Terre Haute, Ind. Aldwych House, Aldwych, W. C. 2, London, England.



Capacity—40 to 80-ft. per minute; dimensions—20-ft. long by 40-in. wide by 40-in. high

fluid outlets supplies paint at required speed. Clean, dry air is provided for the air guns and pressure tanks by a 32-ft. capacity air-conditioning unit.

This air-painting equipment is furnished with a fireproof ventilating unit including duct and collectors, which removes all mist and provides clean and healthy operating conditions.

Similar units in smaller or larger sizes are made to order.

Furniture Assn. Plans Promotional Work

That plans for the promotion of the Grand Rapids Furniture Exposition Association are beginning to crystallize is indicated by the recent appointment of A. P. Johnson to head a publicity and educational bureau for the association, and P. S. (Phil) Johnson to take charge of personal promotion activities.

Both men, although unrelated, long have been prominent in the field of furniture publications and market interests. These men will work in conjunction with C. F. Campbell, the new secretary of the association.

Promotional plans will include not only solicitation of new exhibitors and buyers, but a comprehensive educational campaign directed toward the public and carried through in cooperation with stores exhibiting furniture purchased in Grand Rapids.

Finish Corporation Organized

Leon Finch Ltd., (manufacturer of lacquers, paints and varnishes) announces the opening of a factory and office at 750 E. 59th St., Los Angeles, Calif. This corporation has been organized to manufacture a complete line of finishing materials.

Dolan Opens Branch Office

V. J. Dolan & Co., Inc., 1830 N. Laramie Ave., Chicago, announces the opening of a new Evansville, Ind., office at 503 Furniture Bldg. Mr. Leonard G. King will be in charge and his increased volume of business in the territory has warranted the establishment of convenient and permanent quarters.

Meetings Scheduled Next Month

Forty-fourth Annual Convention of the National Paint, Oil & Varnish Assn., will be held October 5, 6, 7, 8, at Atlantic City, N. J., with headquarters in the Ambassador Hotel. George V. Horgan, General Manager, 2201 New York Ave., N. W., Washington, D. C.

Questions and Answers

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer any further comments or recommendations pertinent to subjects mentioned

Stained Porcelain Enamel

Will you please let me know if there is any way of removing an acid fruit stain from a porcelain enameled sink? This sink is a combination sink and set tub and the stain is on the bottom where a garbage strainer is used, covering an area of about 6-in. It appears at first glance as though the enamel had chipped off, but on closer examination I find that the enamel is badly stained.—B. H.

First I am inclined to believe that the stained area is crazed, and the stain has probably penetrated the crazed surface and is mostly in the porous undercoat of the finish. If this is true, it can be detected by a large reading glass or a microscope. If such is the case the best thing to do is to send the sink to an enameling plant and have this place refinished.

Second, if this stain is only on top of the smoothly glazed surface, it can be removed by the use of No. 400 sandpaper and again polished with the rouge used for polishing glass. I have removed sulphur dioxide stains this way from porcelain-lined refrigerator tanks.

Third, there is on the market a chemical called "Bowlene," which can be obtained from any grocery store. This chemical may do the work if a wall of stiff dough made of wheat flour and water is laid around the stained area so that the chemical will not spill out nor leave the stained spot; then the chemical should be mixed with water and let stand on the spot for 15 or 20 minutes.

Fourth, a formula for removing stains from marble may work as well on porcelain. This is a recipe from a book called "Work Shop Wrinkles" by W. Norman Brown. I have never tried it, but I am sending it along as a suggestion.

Take 1-oz. ox gall, 1 gill of lye, 1½ tablespoons of turpentine. Mix and make into a paste with pipe clay. Put the paste over the stain and let it remain for several days; then wash off.

The article also states that ink spots may be removed as follows:

Take ½-oz. butter of antimony and 1-oz. of oxalic acid. Dissolve in 1-pint of rain water; add enough flour to bring the mixture to a proper consistency. Lay it evenly on the stained part with a brush, and after it has remained for several days wash it off and repeat the process if the stain is not wholly removed.—M. V. Leach.

I suggest you first take hot water with very strong caustic soda, and let it lie in the sink 1½ hours. Then rinse with clean water. Dip a small piece of burlap or any rough cloth in de-

natured alcohol and then in dry lampblack. Rub this briskly over the surface where the stain is, and be sure to keep the cloth wet with plenty of the alcohol and dry carbon lampblack for best results. This method will clean and polish both at the same time without damaging the porcelain finish.

If the sink is stained so badly that this method won't remove the stain, I will send you one that will, but I cannot assure you that it will not injure the finish on the sink.—Geo. Moskos.

Finish Fireproofed Lumber

We are urgently in need of information as to the best methods and means to be employed in the finishing of fireproofed lumber. We would also like to know what precautions should be taken to prevent the sweating of the lumber and the blurring of the finish, especially when this work is installed in a new building where a general degree of dampness prevails. Please advise what materials are most practical, such as lacquer, varnish or shellac.—A. S. C. Co.

Regarding the best material to use in finishing fireproofed lumber, I should say that under ordinary conditions lacquer would be best. However, if the conditions of the building in which this lumber is used, are very damp, I suggest that you use spar varnish for the final coat.

The fire proofing process opens the pores of the wood. When finishing materials are applied to the face of the lumber, they naturally seal the pores. Moisture enters the lumber from the back and edges and penetrates the wood until it reaches the finished surface. Of course, the moisture cannot go through the finish, but it will cause sweating and will blur the finish.

This trouble may be avoided by applying a heavy brush coat of asphaltum paint to all exposed edges and the back of all woodwork before it is installed. Asphaltum paint may be obtained in black and dark brown and red, so that you may match the face finish to a degree. It is very important to see that all edges, ends and backs are coated.

Chemicals used in the fireproofing process render water stain impractical, so you will probably have to use an oil stain. Allow this to dry and then fill and clean in the usual manner. If a shaded job is desired you may apply spirit shading stain after the filler

EXPERT MANUFACTURERS

Refrigerator Lacquer Enamels, Dip or Spray Stains, Quick Drying Fillers, Lacquer Sealers, Gloss and Flat Clear Lacquers.

G. J. Liebich Co.

SAN-ITAI-RIE FILLER CO., Division

931 N. Ogden Ave. Chicago, Ill.

ZELLAC

"BARGAIN BUYING"

—*means "headaches" and losses for you*

Do not imagine that you are getting, at *extremely* "reduced" prices, *exactly the same products* you used to get at higher pre-depression prices. While changed conditions have justified some price reductions, the *extreme reduction* cannot be justified except by substituting lesser quality and value. The shrewd business man realizes that many concerns are deliberately offering inferior products at extremely reduced prices in order to tempt the "bargain" buyer.

Bargain lacquers represent definite losses through greater labor costs, inferior quality of finish, lost sales and, last but not least, finishing difficulties and come-backs.

Zeller has never offered "bargain" materials! Zeller grades are value grades, consistently offered as efficiency products priced always as low as possible. Your own tests will establish these facts.

Attention is called to our Zellac Super Wood-Sealer, Wood Lacquers, Zelactite grades for Crystalline Finishes, Zellac Outdoor Exposure clear lacquers and lacquer enamels, and innumerable other grades for every conceivable industrial purpose.

ZELLER LACQUER MFG. CO., Inc.

20 East 49th Street New York City

CHICAGO WICHITA
LOS ANGELES SEATTLE SAN FRANCISCO

ZELLER

is dry. Then apply a thin coat of lacquer sealer and sand lightly, taking care to avoid picking up the shading stain. Apply a coat of gloss lacquer and follow with a coat of flat lacquer. After the lacquer is dry, apply a brush coat of hot wax. Ordinary paste wax may be melted and applied with a brush. This wax coat aids in protecting the finished surface against moisture.

In the event you desire to use a varnish finish, follow the above schedule up to and including the lacquer sealer coat, then apply a coat of gloss varnish (thin). Sand closely, and apply a coat of spar varnish.

You do not state the species of wood to be used nor the finish desired, but I believe you will be able to work out a suitable finishing schedule from the above.—P. C. Bardin.

Radiator Covers Rust

May we have your suggestion as to what to mix with the oil primer to prevent rust? We manufacture radiator enclosures, which are set over radiators, being subjected to heat for hours at a stretch. Immediately beneath the cover is a water pan, the hot moisture of which seems to penetrate into the paint and causes it to rust. What remedy is there for this?

You have a very difficult condition to overcome in attempting to prevent rust accumulating on metal covers subjected to both heat and moisture. I know of no product that may be mixed with an oil primer that will remedy this trouble.

If you have not done so, I suggest that you take the matter up with a rust-proof concern, regarding their process, perhaps submitting sample panels (unfinished) then use these treated panels to experiment with under actual conditions. I cannot say definitely that bonderizing will eliminate your trouble; however, the process is known to be rust retarding.

You do not state whether or not you are baking your primer, but baking is your only hope.

I suggest you also take the matter up with the concern from whom you buy primer, in an effort to secure a long-oil primer that may be baked at a high temperature. There are a number of concerns who manufacture special long-oil primers; several advertise in INDUSTRIAL FINISHING.

Then, too, you might experiment by adding 1% castor oil to the primer. This produces a "wet coat" and will aid in the adherence of the primer to the metal, which is desirable, especially under the adverse conditions you mention. Please understand I do not say that the addition of castor oil will remedy the trouble, but it may have a tendency to prolong the life of the finish.—C. J. L.

Coating Glass Beads

We would like information as to the best method of spraying or dipping glass beads, both single (beads unstrung) and strung in lengths of 3 to 16-in. In order that you may clearly understand our problem, we are sending you four beads of the size and shape we desire to finish. These four beads are each of a different type—one is a half bead with no hole in the center, another is a half bead with a hole only part way through the center, another is elongated or more or less oval in shape, and the other is heart-shaped. Both the

BINKS *NEW*

"THOR" Model 2

SPRAY GUN

Inset photo shows the key control feature which is optional.

Saves Time and Material *and therefore . .* MONEY

Now—you can have a spray gun that delivers either a flat or a round spray—without adjusting the nozzle. The change is effected by turning a thumb screw at the back of the gun, or with a removable key, and requires no more time than the setting of a watch. . . . This revolutionary improvement is one of many exclusive features of the Binks "Thor" Model 2. It eliminates lost time and wasted material while making the adjustment, and therefore saves its cost in a short time. . . . This new, improved spray gun has embodied in its design every desirable feature you could ask for. Write us for a bulletin giving all the details or inquire of your paint jobber.

BINKS MANUFACTURING CO.

3001 CARROLL AVENUE CHICAGO

Offices and representatives in 16 cities

Everything in Spray Gun Equipment

elongated and the heart-shaped beads have a hole extending clear through the center.

It is probable that each of these beads will require a little different way of handling, regardless of whether the dipping or spraying method is employed. We will appreciate your suggestions in the matter.—J. R. M. Co.

First, let us consider the small yellow, lacquer-enameled bead, or half bead without a hole in center. I believe the only practical method of finishing these half beads is to stick them on a sheet of 2-ply, glue-sized paper. Allow a short time to elapse so that the flat glass surface will adhere to the glue coating; then spray the finish on the beads. After the finish has thoroughly dried, remove the heavy backing paper, and apply clear water to the thin tissue, on the reverse side; then the half beads will drop off. The water will penetrate the thin tissue quickly, and as the glue coating is very thin, none of the glue will adhere to the glass surface. I am sending you a small sample of this paper, which you will notice is similar to the paper on which decals are printed. The reason for attaching the beads to the paper is to prevent the air pressure of the spray from blowing the half beads off the surface on which they are placed for spraying.

This half bead offers an admirable surface for dipping, which would be a more economical method of finishing. In this connection, I suggest the following as an experiment:

Place the half beads on a wire screen, the mesh to be as large as possible and still not allow the beads to fall through. The beads should be spaced reasonably far apart to permit the finishing material to flow over the beads as the wire screen is submerged in the material. Submerge the screen slowly and carefully, so that the beads will not lift up nor turn over as the material flows through the wire mesh.

Because these half beads are so small and light in weight, I suggested the spray method first as the most practical method, and dipping as an experiment.

Next let us consider the clear glass, half bead with the hole extending only part way through. These beads could be mounted on a frame consisting of a series of small wire projections of a size to fit the holes in the beads, then spray finish beads on this frame, and remove when dry. This is the only method I am able to suggest in which the beads could be finished all around or all over.

The elongated and heart-shaped beads having a hole all the way through offer the same problem. In the event you do not find a suitable dipping machine for these beads, I suggest as a substitute a machine similar in design to the one shown on page 56 of Sept. 1930 INDUSTRIAL FINISHING. You will notice this machine is used to hold casket handles for spray finishing. Of course, your requirements would demand a smaller machine, and in your case it might be desirable to have the wires on which the beads are strung to revolve as the frame revolves. By this I mean that the wires on which the beads are strung have one flat end which fits into a socket. These sockets are geared to the turning mechanism so that they will rotate the wires containing the beads as the wires revolve around the frame.

There is no doubt that a spray finish would produce excellent re-

JONFLEX

Precision-Edged Masking Tape

LEAVES a well-defined, clean-cut edge. Easily applied and removed. No crinkling or buckling in application, and no fuzz or ravel left when removed. Lacquer and solvent proof, it is the unanimous choice of all expert craftsmen.

•

Send for free sample roll and be convinced of its perfection

•

JOHNSON & JOHNSON
New Brunswick, N. J.

THIS very snappy remark was originated by Joel Chandler Harris, one-time editor of the Atlanta Constitution and creator of the Uncle Remus stories. It very happily applies to the buyers of lacquers.

Practically every freshly sprayed product looks fine . . . . but when the weeks and months roll around and crazing, cracking, chipping, peeling, roll around with them—somebody catches it for hiding the fire. First the dealer gets it, then he passes it to you.

What a lacquer will do is in the lacquer when the drums come into your plant. If your product's finish stands up for ten years . . . that was in the lacquer, if it falls down in three months . . . it was in the lacquer.

Users of ALAKA, the Practical Lacquer, are not finding these difficulties. When you buy ALAKA you don't have to be a smoke-eater . . .

WRITE FOR

(1) Finishing Facts
(2) Samples
(3) Salesmen

LACQUER & CHEMICAL CORPORATION

Makers of ALAKA Lacquer

BROOKLYN, N. Y.
214-224 40TH ST.
SUNSET 6-4864-5-6

CHICAGO BRANCH
2539 W. LAKE ST.
WEST 2043-4

sults in this case. Spray finishing generally gives the best results, but due to the small size of your product, this method is likely to be expensive. I have experimented with the two beads you submitted by dipping the elongated bead into a 20% solid lacquer and the heart-shaped bead into a 5% solid lacquer, and I believe if you will use a very thin dipping lacquer, such as is used on silverware, the results will be satisfactory. In using the 5% solid lacquer, I found there was only one drop of material which dripped off the bead after it was removed from the lacquer; however, the material being of such thin consistency, it will have no damaging effects on the finish of any other beads on which it might drip.

In view of this, I suggest the dip method for these two types of beads. In the event you use a machine as outlined above, the dip tanks should be located at the bottom of the frame in such a position that as the wires containing the beads revolve around the frame they will pass through the lacquer. Then, as they travel up the frame they will drain.—P. C. B.

Reclaim Gold Bronze

We are wondering if you have heard of any method by which we can salvage Karatgold powder or goldleaf after it has been mixed with bronzing lacquer and sprayed on metal. We use a great deal of bronzing powder and find that we have quite a lot of this powder which forms on the side of the spray booth, which we would like to salvage, and use again. We are wondering if there is any method that we can use to reclaim this material. We have tried using

WATEROIL STAIN

Is an *absolute* water stain,—fast to light,—NON GRAIN RAISING. It produces a *clear* clean uniform Water color, prevents excess absorption of Sealers and Lacquer. DOES NOT BLEED. Covers larger area per gallon than any other type of stain.

WATEROIL RUBBING OIL

Ask any user—NO HAZE OR BLUISH BLOOM. No greasy finger marked finish. It rubs dry,—clear and clean and remains that way. Mix it with water,—it is also an exceptional Clean-up polish.

ORDER NOW

V. J. DOLAN & COMPANY, INC.

"Unquestionable Quality"

WOOD FINISHING SUPPLIES

1830 N. Laramie Ave. Chicago

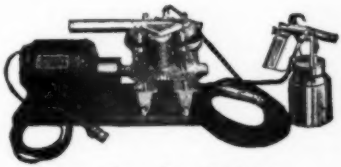
Reasons why

SUPER SPRA-MORE "55"

reduces finishing costs

If spray painting with portable equipment meets your needs, we'd like to give you the facts about the Super Spra-more "55" as they apply to *your* kind of a job . . . showing you how you can effect substantial savings in the finishing of your product . . . telling you what other manufacturers with similar problems have done toward reducing finishing costs with the Super Spra-more "55".

These facts will give *you* the secret of making extra profits. The Super Spra-more "55", because of its portability and greater painting power, is highly efficient for smaller production jobs and all maintenance work. Send for descriptive details today!



Price, Complete $78.50

CROWN SPRAY GUN MFG. CO.
1218 Venice Blvd., Los Angeles, Calif.
Gentlemen:
Kindly send me details of Super Spra-more "55" and information regarding the reduction of finishing costs.

Name . . . . . .
Address . . . . . .
Type of Product . . . . . .

CROWN SPRAY GUN M'F'G CO.
1218 Venice Blvd., Los Angeles, Calif.
Stocks of Crown Equipment carried in Eastern and Middle Western States

Kindly mention INDUSTRIAL FINISHING when writing advertisers

thinner to reduce the hard cake to a liquid, but are unable to remove the bronze from the thinner, so we are just about as far as we were when we started.—F. C. Co.

In regard to your inquiry about salvaging gold and bronze powder after it has been mixed with lacquer, I do not believe a great deal has been done along this line. The reclaiming of this material has been brought to my attention several times, but thus far the only salvaging done has been to burn the hardened material and reclaim the brass.

However, there is a material on the market, I believe, that is used to retard the jellying of gold and bronze lacquer. Just how successful this process is I am unable to say, nor do I know whether or not the material is capable of rendering the hard cake material you speak of, useful.

The production manager of one of the well-known reliable finish manufacturing concerns (name on request) has made some experiments with this material and with hardened bronze lacquer. I am sure he will be glad to experiment with your material and advise you of the results of these tests.—P. C. Bardin.

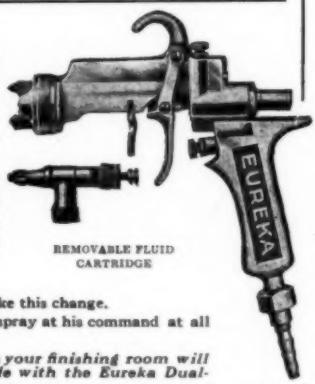
I believe using thinner is the logical way to reclaim bronze powder that has caked on the spray booth, but I suggest using an inexpensive thinner for reducing the solid mass to a liquid, since a large amount of thinner must necessarily be used to cut the lacquer and gums that are in the liquid

EUREKA DUAL-VALVE SPRAYER

Round or Flat Spray Controlled by the Trigger

The round spray is necessary for finishing narrow surfaces.

Why waste material when finishing narrow surfaces or inaccessible corners with a wide flat spray when the Eureka gun permits the operator to change from the *flat spray* for finishing large surfaces to the *narrow round spray* by a movement of the trigger?



REMOVABLE FLUID CARTRIDGE

No adjustment necessary to make this change.

The operator has both types of spray at his command at all times.

A practical demonstration in your finishing room will show the actual savings made with the Eureka Dual-Valve Sprayer.

EUREKA PNEUMATIC SPRAY CO.

128 White St., New York

New Catalogue Sent on Request

after the bronze has fallen to the bottom. The top should be drained off and the bronze powder washed with clean thinner to prevent it from forming a solid mass after the thinner has evaporated.

After the bronze powder has been washed several times, remove as much of the thinner as possible and evaporate the balance with a hot water bath.

However, since the bronze powder is to be used again, I see no harm in leaving the thinner in the bronze powder, as the proper way to mix bronze powder is with thinner first, adding the liquid later. This makes a better solution; it is free from undissolved powder and gives a smooth finish. —August L. Medel.

EDITOR'S NOTE: All industrial finishing problems and questions submitted to this department of INDUSTRIAL FINISHING for answer must carry the name and address of the correspondent on the original inquiry; otherwise they will not be answered. The inquirer's name will be kept in confidence if he desires it.

Worthington Acquires Metalweld

The Worthington Pump and Machinery Corp., Harrison, N. J., announces that it has acquired the manufacturing and marketing facilities of Metalweld, Inc., Philadelphia, Pa., builders of a complete line of portable compressor units. For many years Worthington has been a leader in the compressor industry. Last year it took over the manufacture and sale of Gilman rock drills and accessories. This together with the added line of portable and semi-portable compressors and other tools, will enable Worthington to supply all air equipment requirements of contractors, railroads, utilities and industrial users.

Worthington's Feather Valve compressors always have been an integral part of Metalweld portable units. The portable compressors will be manufactured at the Harrison, N. J., Works of the Worthington Pump and Machinery Corp., and the engineering, manufacturing and sales personnel of the Metalweld organization also will be located there.

THIS new Sanding Sealer marks an important advance over the regular sealers or primers now on the market. Decidedly different in construction—it has vastly improved working properties—that assure better results and greater economy.

It may be thinned as high as 50% with any good lacquer reducer—works successfully even when the humidity is high without leaving a permanent blush—can be sanded within one or two hours after it is applied without gumming paper—is an excellent sealer under either varnish or lacquer. Its solid content is extremely high and it stands the steam and boiling water test without turning white.

Order a trial drum today and give this new Sanding Sealer a rigid testing in your plant. The result will convince you.

■

JAMESTOWN WOOD FINISHING COMPANY

Jamestown, N. Y.

Branch Offices

Meriden, Conn. **New York City**
Milwaukee, Wisc. **Lenoir, N. C.**

The Finish Looks Like Glass But It's Berco "Glisson" Enamel

This bread box and set of canisters were finished with BERCO "Glisson" 1-Coat Enamel. (Manufacturer's name on request.)

5 OUTSTANDING ADVANTAGES

Maximum thinning
No special thinner required
Covers solidly
Glass-like finish
Does not "paper print"

BERCO 1-Coat "Glisson" Enamel bakes or air dries to a hard, glass-like finish entirely unlike paint. It looks like glass.

Our Technical Laboratory developed BERCO "Glisson" 1-Coat Enamel to give good covering over black iron with a very thin film. It covers it solidly in one coat, eliminating the priming coat and saving nearly one-half the usual spraying time.

With BERCO "Glisson" 1-Coat Enamel you get maximum thinning and maximum production per gallon with a lower unit finishing cost. **No special thinner is required.** We tell you how to thin it to get the best results.

BERCO "Glisson" 1-Coat Enamel adheres and levels perfectly, forms a tough elastic film that resists abrasion. It does not "paper print" or "orange peel." Write for free quart sample to try out in your own plant. State color wanted or send sample to be matched.

We also make BERCO Enamel for use on wood, requiring only one coat on properly prepared surfaces, for spraying, dipping, or brushing. Write for further information.

VARNISHES
LACQUERS

BERCO

ENAMELS
UNDERCOATERS

NORTH BERGEN VARNISH CORPORATION

989-1005 39th STREET **NORTH BERGEN, N. J.**

Represented in

NEW YORK **ROCHESTER** **PHILADELPHIA** **HIGH POINT**

Metal Finishing Department

Cleaning-Handling Baking & Polishing

How We Reduced Enameling Costs

Chief Engineer of Cribben & Sexton Co., Chicago (manufacturers of gas ranges) in collaboration with A. C. Nielsen Co., engineers, gives facts and figures on savings effected in porcelain-enamel finishing by the installation of a continuous furnace and improved methods

By FRED DEERING

IN THE PAST few years there has been an ever increasing market developed for metal products finished in vitreous enamel. Food appliances for the modern home, hotel, restaurant and drug store, from stoves to refrigerators, bear evidence of the widespread use of the "clean finish." With greater demand, came the necessity for reduced costs. We felt it would be unwise to lower the quality of our finish; therefore we naturally turned toward the possibility of making improvements in our equipment and methods of handling.

* * *

Cost analysis reveals that new continuous furnace reduces spoilage, labor expense and fuel cost.

* * *

Returns 95% annually on initial investment.

* * *

Former Equipment

Formerly one batch type dryer and three batch type furnaces were used to dry and burn the output of the plant. These were considered efficient examples of that type of furnace, consequently the saving now realized is entirely the result of the improved design and operation.

These furnaces were very expensive to operate for a number of reasons. Fuel expense was high, labor costs were practically three times the present figure and

spoilage discovered at final inspection ran between 14% and 15% as compared with the 8% to 9% now found. In addition, so many pieces were rejected before even being burned that it was necessary to employ one man who did nothing but wash off spoiled enamel. The method of operation under former and present conditions is more fully developed below.

Operation

Ware is given a ground coat and passed through a dryer, after which it is either stippled or black-edged and then burned, or burned directly. Operations up to the point of burning are the same now as formerly.

Formerly the ware was loaded into racks on trucks after receiving the ground, the stippling or black-edged coat if the latter were desired. The loaded trucks were pushed out of the way and left for the night shift to burn.

The ground coat, or ground plus stipple and black edging, were burned by being loaded on to burning racks which were run into the furnaces and kept there for the proper length of time. Each of the furnaces had a crew of two men, who were paid at a high rate due to the necessity of skillful loading, careful unloading, and because of the high temperature to which they were required to expose themselves.

When the ware was removed from the burning racks, it was still too hot to be properly inspected and so was placed on racks and hauled away to cool somewhat before inspection. A laborer was required to shift the trucks around for this purpose, and also two additional men who later inspected the ware as they unloaded it from the racks.

The necessity of handling in and out of narrow racks with this method was the cause of damage to a considerable amount of ware before it came to the furnaces. Exact records of the ware thus damaged (not included in the spoilage figures given above) have not been kept, but sufficient ware was discarded by the operators of the furnace for this reason to keep one man employed washing off spoiled enamel.

First and second coats of enamel were applied as desired over the ground coat, and then dried in a batch dryer which required the services of two men. Burning and inspection was then performed as before. Black-edged ware had the additional process of brushing after the first enamel coat had been sprayed on and dried.

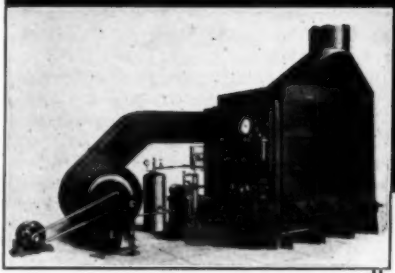
Fuel costs were high because of the difficulty of controlling temperature and due to the loss of heat occasioned by the intermittent operation of the furnaces. The savings of fuel, as revealed by cost figures, are not a complete measure of the actual economy, since a more expensive type of fuel is being used exclusively at the present time, whereas formerly one furnace was supplied with a less expensive fuel. The lower priced fuel could be used with the present furnace except for considerations not having to do with the design of furnace.

The most serious objection to the former method was the high labor expense caused both by the number of men required and the rate it was necessary to pay men for this type of employment. The burners who operated the furnaces had to be skillful men as well as physically able to stand the intense heat radiated by the furnace and burned ware.

OIL — NICHOLS — GAS

Air Heating Systems

insure these advantages in your baking and drying operations



Plants making products requiring baking of enamels, drying paints, lacquers and coatings are procuring these advantages as a sound paying investment. Production is increased, manufacturing unit costs are lowered — and better, more desirable finishes are consistently assured.

- Efficiently burns the most economical fuel.
- Low installation cost.
- Low maintenance costs.
- Low operating costs.
- Better heat distribution.
- Better air circulation.
- Automatically safe.

Send details of your processing problem for our recommendations. Bulletins promptly sent on request.

PIONEER BUILDERS OF AIR HEATERS

NICHOLS PRODUCTS CORPORATION

DIVISION OF ROSS INDUSTRIES CORPORATION

12953 Greeley Ave., Detroit, Mich.

NEW YORK CLEVELAND CHICAGO PITTSBURGH PORTLAND, ORE.
HUNTINGTON, W. VA. LOS ANGELES, CAL.

Present operation requires the same number of processes applied to the ware, so that the savings result from greater convenience reduced handling with a consequent reduction in labor cost, less spoilage and lower fuel costs.

Now the ware can be placed by two men on the conveyor, dried, burned and cooled to a temperature at which it can be inspected and handled before being removed and sent to the assembly department. Thus, a ground coat requires no handling from the time it is sprayed and placed on the conveyor until removed by the inspectors who place it on the conveyor running to the assembly department.

If extra coats or processes are required, these are handled at convenient points adjacent to the conveyor, which makes a circuit into the room for this purpose at either end of the furnace. When such extra coats or brushing operations are required, the ware is removed from the conveyor, the operation performed and the ware replaced on the conveyor again without additional handling. Much time and labor is saved this way, and the ware is not subject to injury through handling in and out of racks as in the former method.

Former Fuel-Labor Cost

Let us consider the fuel question first. One of the batch type furnaces was heated by oil burners and two by manufactured gas. One furnace consumed 16 gallons of oil per hour @ 6c per gallon. Based on a 100-hr. week, this makes a weekly fuel cost of $96 for one furnace. The other two furnaces consumed 4000-cu. ft. of gas per hour @ 52c per M. cu. ft. Based on a 100-hr. week, this makes a fuel cost of $416 for two furnaces, or a total weekly fuel cost of $512 for the three furnaces.

The crew necessary to operate this equipment consisted of two dryer men, six experienced burners, one laborer to wheel ware away from the furnaces, and two inspectors. There were two crews, one for the day and another for the night shift, and one man was employed during the day only to wash enamel off defective work. The total weekly labor cost amounted to $925.00.

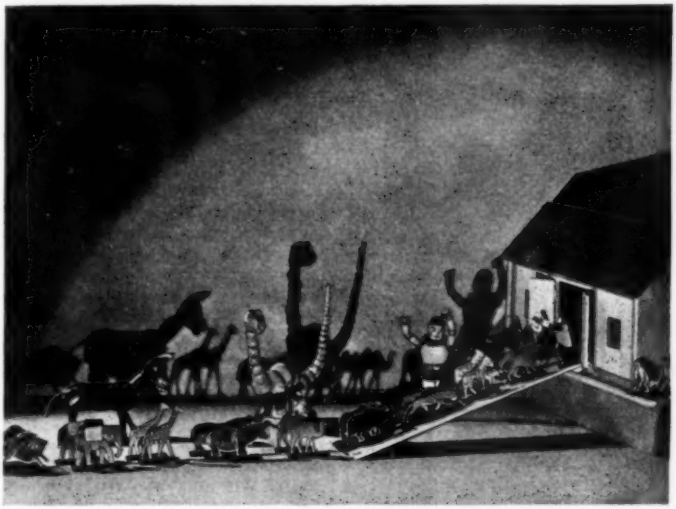
Very little electrical energy was needed to operate this equipment, so the weekly power consumption was estimated at $3.00.

This equipment comprising one dryer, three furnaces and necessary trucks represented an investment of $25,000. To obtain the fixed charges we shall figure depreciation based on 10-yr. life—$2,500; average interest @ 6%—$825; and an annual repair and maintenance allowance of $3,000, which gives us a total annual fixed charge of $6,325. Using a 50-week operating year as a basis, the weekly fixed charges amount to $126.50 which, added to the fuel, labor and power costs, produces a total weekly operating cost of $1,566.50.

Present Equipment

The present equipment includes a continuous furnace heated by manufactured gas, having a hot zone 31-ft. long, 27-in. wide, and 36-in. high. Located parallel to this furnace is a continuous dryer through which ware is carried on the same conveyor that serves the furnace. Heat necessary to operate the dryer is reclaimed from waste gases as they leave the furnace, by means of suitable heat-exchange apparatus. At either end of the furnace, this conveyor swings out into the room to give

WITH THE RIGHT FINISH, YOU'LL FINISH RIGHT



Lilly's Toy Enamel

Just as "the animals came by two by two" to Noah's Ark, the parade of the toy manufacturers is heading toward Lilly's.

Vivid, compelling brilliance—for both wood and metal toys and novelties, from the smallest playthings to large wagons, velocipedes and other wheelgoods. Send for samples of Lilly's Toy Enamels for test.

LILLY VARNISH COMPANY

666 S. California St. Indianapolis, Ind.
273 N. California Ave. Chicago, Ill.

Lilly Enamels, Lacquers, Fillers, Stains and Varnishes are acknowledged leaders in quality. We'll be glad to figure on your present or future industrial requirements.

LILLY

Kindly mention INDUSTRIAL FINISHING when writing advertisers

R-150 Chemical Cartridge Respirator

We Couldn't Improve the Respirator, so—

we furnished it in a sturdy metal container to store away when not in use — thus assuring maximum durability.

This announcement, made in our previous advertising, brought an instant and favorable response and represents, we believe, a feature well worth investigating.

Compare the PULMOSAN R-150, point for point, with any similar respirator on the market today; compare the price; then bear in mind that it comes packed in a metal container *at no additional cost.*

Pulmosan Safety Equipment Corp.

176 Johnson St., Brooklyn, N. Y.

Send me full details on Pulmosan R-150 Respirator in metal container.

Name.....

Address.....

.....(I. F.)

free working space for the placement and removal of ware, and to permit convenient grouping of all other operations around the conveyor.

The continuous furnace consumes 6,340-cu.ft. of gas per hour @ 52c per M. cu. ft. Based on a 100-hr. week, this makes a total weekly fuel cost of $329.68.

As the conveyor speed absolutely controls the burning period, and as this speed may be simply and definitely fixed for varying periods adapted to burning different gauge steel in either the ground or enamel coats, experienced burners are not required. The crew necessary to operate this equipment consists of two men to place ware on, and two men to remove ware from conveyor, and one general helper. There are two crews, one for each shift. The total weekly labor cost amounts to $310.

Electric power necessary to operate this equipment is 7.5-kw. @ 3c per kw. hr. Based on a 100-hr. week, this makes a total weekly power cost of $22.50.

This new equipment represents an investment of $40,000. Figuring depreciation based on 10-yr. life—$4,000; average interest @ 6%—$1,320; and an annual repair and maintenance allowance of $2,000, we have a total annual fixed charge of $7,320. Using a 50-wk. operating year as a basis, the weekly fixed charges amount to $146.40 which, added to the fuel, labor and power costs, produces a total weekly operating cost of $808.58.

Due to more uniform and constant temperatures and improved handling afforded by the present equipment, the spoilage of ware has been reduced from 14-15% to 8-9%.

From the above cost figures we

observe that there is an actual saving of $757.98 per week. Basing a year's operation on 50 weeks, there is a saving of $37,899, which represents an annual return on the investment of 95%.

Spraying, brushing and other incidental operations are not included in these calculations or findings, as the small differences that exist between past and present operation in these respects are entirely independent of furnace and dryer operations.

A capable key man in an organization, through sheer ability and personality, often can lead a faulty organization to successful results.

Air Heating Folder

The Nichols Products Corp., 12953 Greeley Ave., Detroit, Mich., has ready for distribution a new illustrated 3½x8½-in. folder which is the second of a series of folders prepared on the subject of heating industrial buildings by the use of oil or gas fired heaters.

Pearl Essence; Richelieu Cloisonne

Mr. Harry E. Mattin of Mattin Laboratories has been retained by Jos. H. Meyer Bros. of Brooklyn, N. Y. as chemical director of their Pearl Essence activities.

Pearl Essence is now being used by one automobile manufacturer to give certain color effects, and is being tried out by one of the largest makers of bodies in the country, with great promises for its wide use. Undoubtedly Pearl Essence has come into its own as an ingredient of lacquer finishes.

Mr. Mattin is also the inventor of Richelieu Cloisonne, a new and lustrous lacquer finish, not only resembling the hand tooled cloisonne enamel, but due to its natural lines, it gives a much more beautiful effect. The finish is applicable on any surface that can be lacquered. It is now being investigated by the leading casket, refrigerator, furniture, automobile and metal and wood novelty industries.

Jos. H. Meyer Bros. will begin distributing samples of the effect in the very near future.

Announcing—

THE BEACH

Automatic Conveying Spracoater

All kinds of industrial products automatically sprayed on one or three sides simultaneously while passing through machine on conveyor.

Will coat panels, radio cabinets, furniture, refrigerators, cabinets, caskets, buttons, toys, irregular surfaces, etc. Also adaptable for coating material fed through rolls, such as leather and wallpaper.

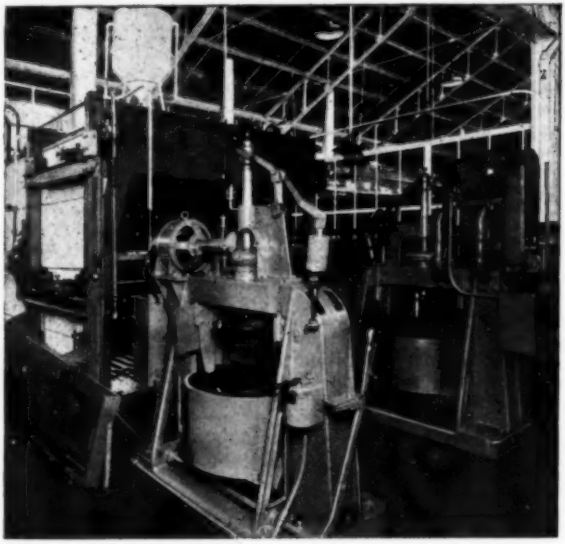
The design and construction of this machine is such that spray shuts off automatically as the nozzle passes back and forth over edge of work. The spray coating can be regulated from a side control while machine is in operation.

Complete installation includes Automatic Spracoater, Exhaust System, Air Compressor Unit and Pressure Feed Air Brush. Fully protected under Patent No. 1,812,854. Special machines built on order or at your plant.

Investigate this great continuous line production Spracoater.

Write for complete descriptive information and copy of patent

WILLARD C. BEACH
AIR BRUSH COMPANY
HARRISON, N. J.



Ford Automobile Finish—II

By
P. C. BARDIN

Illustrating and describing some of the Ford Motor Co.'s production methods and equipment used for cleaning and finishing wheels and sheet-metal parts such as fenders and hoods—at a typical branch plant

THE SAME ELEMENT of controlled production methods and materials, as outlined in last month's article (page 12), is to be found in the wheel and sheet-metal finishing departments. The Ford Motor Co.'s policy is to always have a supply of all finished parts ready for the assembly line. Of course most of the time, car bodies, sheet metal parts and wheels meet at the prescribed place and at the appointed time. However, no system is absolutely perfect, so those who planned the production layout have equalized whatever imperfections may arise, from special jobs to trouble on the lines, by placing supply stations convenient to the assembly line for moderately small finished parts, and power conveyor storage for larger parts including car bodies. Hence

Illustration at top of page shows combination dipping-and-whirling machines for automatically finishing automobile wheels.

TURN DOWN THE FIRE . .

Rezyl-type enamels bake at lower temperatures . . . . . .

Cut oven temperature to 200° F. Give parts a 1-hour bake. This practice is regularly recommended for enamels formulated with Rezyls.

Rezyl-type enamels are tough and elastic. Their adhesion is excellent. Their high gloss is durable. While 1-hour at 200° is the minimum recommended, the longer Rezyl-type enamels are allowed to dry in the air, or bake at low temperatures, the greater the adhesion and elasticity of the film.

Rezyls are opaque to destructive short rays of sunlight and impart this property to finishes in which they are used. This exposure resistance of Rezyl-type finishes makes them of utmost importance to anyone using finishes.

For wood, metal, fabric, paper or leather.

FREE—*An Important Booklet* containing test data and basic formulas on Rezyls. When writing, mention name of your supplier.

Industrial Chemicals Division

American Cyanamid Company

535 Fifth Avenue New York

AMERICAN CYANAMID COMPANY, 535 Fifth Avenue, New York
Send the booklet, "Rezyls" and other information on
☐ Air Drying Finishes ☐ Baking Enamels ☐ Lacquers for use on:
☐ Furniture ☐ Textile ☐ Clear ☐ Wood
☐ Industrial ☐ Automotive ☐ Pigmented ☐ Metal

Name _____
Address _____
For attention of _____

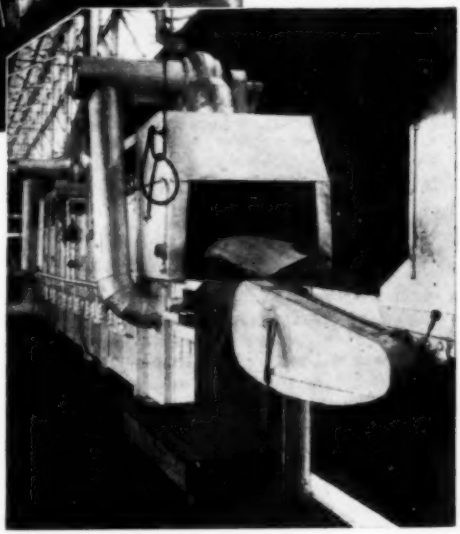
Kindly mention INDUSTRIAL FINISHING when writing advertisers

you will see there is no lost motion or time wasted on the assembly line waiting for parts.

Wheel and sheet-metal finishing are closely allied to car body finishing, many of the lines running parallel and adjacent to the body lines. The same central pressure-feed tank system services spray booths in both departments. The enamel dip tanks are directly connected by pipe lines with the supply tanks in the finishing-material storage building, and by means of an adequate pumping system the dip tanks may be filled or drained as desired. Each evening the enamel is pumped back into the storage tanks; in the event of a fire in the dipping room, the pumps are capable of draining the dip tanks in eight minutes. The entire finishing room, including all spray booths and dip tanks, is protected against fire by an automatic chemical system of an approved make.

All wheels are "bonderized," a

Above: The automatic, conveyorized, washing machine for sheet-metal parts—fenders, etc. This machine is lined up in tandem with the burn-off oven illustrated below.



Right: Fender entering the conveyorized burn-off oven; fender has just passed over the bridge connecting the washing machine and the burn-off oven. Outfeed end of washing machine appears at extreme right; also in the view above.

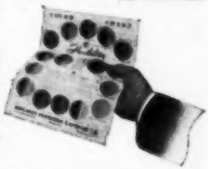
ENGRAVED
Thru'
The Lacquer Film

One-coat of our FLEXIBLE lacquer sprayed on a fairly heavy piece of brass . . . . the brrrrr of a high-speed drill engraving thru' the lacquer film . . . . the rest of the story is told by the photograph.

Prying fingernails find no furry, loose edges around the engraved letters to be peeled off like sunburned skin. Working the engraved plate back and forth in an effort to dislodge or break the film just doesn't have any effect.

Seven odd years have winged by since we first introduced FLEXIBLE finishing materials to Industry. Yet, again and again, a customer expresses astonishment at what our products will do. Occasionally, we, ourselves are to be found wide-eyed and gaping at our product's proven performance. Surely, there must be something here to merit your inquiry.

On request, we shall gladly send a color card showing our 16 standard shades and their respective tints. These same FLEXIBLE materials are available CLEAR.



We shall also send a series of Research Bulletins containing important finishing data which you may desire to place in your files.

Roxalin Flexible Lacquer Co., Inc.
35-40 Thirty-Sixth Street Long Island City, N. Y.

Superior Galvannealed
PATENTED PROCESS

"Superior Super-Metal"
PATENTED PROCESS

Two RUST-RESISTING Steel Sheets Coated with Spelter (Zinc) and Heat-Treated after being Coated. Have Etched Surfaces to which Finishes Adhere Firmly.

Sample and Booklet on Request

The SUPERIOR SHEET STEEL COMPANY
CANTON, OHIO

Division of Continental Steel Corporation — General Offices, Kokomo, Indiana
Plants at — Kokomo, Indianapolis, Canton.

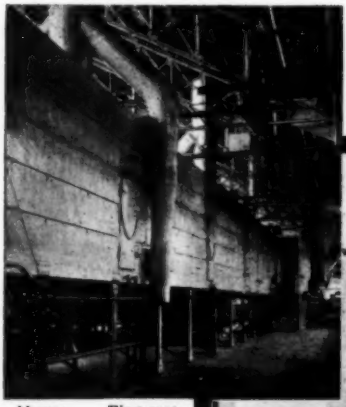
Manufacturers of: Black, Galvanized, Long-Terne and Special Coated Sheets, Roofing and Kindred Products; Billets, Rods, Wire, Nails and all types of Fence. (133)

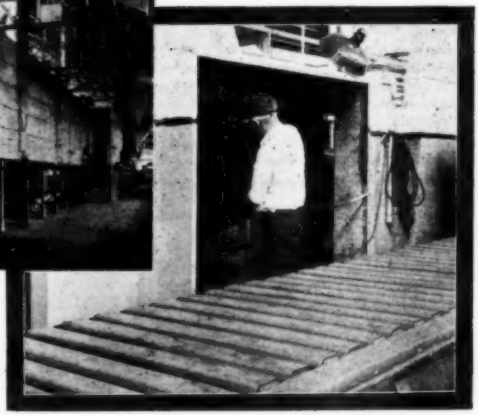
protection against rust; there are two distinct finishing processes employed, one for black wheels and one for all other colors.

Black wheels are received primed and are placed on the gravity conveyor which delivers them to the dipping machines shown in the illustration at the beginning of this article. Here each wheel is placed on a turntable which remains motionless while the wheel is lowered (by means of lever at right of machine) into the cylindrical tank of enamel. As the wheel is raised above the level of the enamel, a projecting arm is inserted between the spokes and, by means of a motor drive the turntable and wheel are rotated rapidly to remove the excess enamel from the wheel. Of course this whirling takes place below the top edge of the circular tank so that all of the "whirled-off" enamel remains in this tank. The wheel is then removed and hung on the conveyor at the entrance of the oven. Wheels remain in this oven 1½ hours at 450°F. At the outfeed end of the oven they are placed on a chain conveyor which carries them through the tire-mounting department to the assembly line.

Wheels that are to receive colors other than black are placed in a booth where the desired color enamel is sprayed on. After air drying 20 minutes a second coat of the same color of enamel is applied. The wheels are then hung on a conveyor which enters an oven where the wheels remain one hour at a temperature of 200° to 225°F., the difference in temperature depending upon the color of enamel.

Fenders are also bonderized at the point of manufacture and are received at the plant in this condition. The fenders are rubbed thoroughly with No. 2/0 steel wool and then run through the washing





Above: First-coat enameling oven. First coat dip room is at left (not visible in this particular view).

Right: Operator spraying the assembled hoods in one of the conveyorized spray booths.

Weather-OMeter

Costs *are* important. A new method or a new material often shows a short cut to important production cost reduction. But — how will it effect the looks and the wear of the product in the hands of the trade two years or even six months from now? The old time finisher draws upon his experience and offers an opinion. Because it is something new and different he is apt to be opposed. The up-to-date shop superintendent or salesman of that method or material finishes some parts with it and puts them in the Weather-Ometer a few hours or days. This accelerated weathering cabinet reproduces under controlled conditions as to sequence and intensity the element reactions the product must face and tells in a short while an incontrovertible story. Let us explain further the uses of Weather-Ometer. Send for Bulletin I. F. 9.

We are also Creators and Distributors of Fade-Ometer—Standardized Sunlight; Launder-Ometer—Standardized Machine for Laboratory Washing Tests; Wear-Ometer—Standardized Wear Test Machine.

New York—Boston—London—Berlin—Osaka

ATLAS ELECTRIC DEVICES CO., INC.

361 W. SUPERIOR ST., CHICAGO, ILL.

Armitage ARMORLAC LACQUERS VARNISHES ENAMELS

ARMORCOID

Trade Name

Synthetic Enamels

(*Baking or Air Drying*)

The paint manufacturer's closest approach to a porcelain finish in enamel.

Has unusual adhesion — hardness of baked finish — high gloss or dull — quick bake. High solids give exceptional build and toughness without brittleness.

Available in one coat white, black and solid colors for metal furniture, refrigerators, etc. Technical advice gladly furnished.

It stands the test!

John L. Armitage & Co.

Established 1876

NEWARK, N. J. and DETROIT, MICH.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

machine where they are washed with boiling water. Upon leaving the washing machine they pass through the burn-off oven wherein they are subjected to a temperature of 600°F. for five minutes to remove all grease and moisture from both concealed and exposed surfaces.

After the fenders have cooled they are washed with an alkali solution to neutralize any acids present; then they are blown off with air, hung on a conveyor, tack-ragged and inspected. From this point, the finishing is accomplished automatically; a continuous conveyor carries them into the dip tank for the first coat of enamel, over the draining pans and into the enamel oven where they remain for 1¼ hours at 450°F. Continuing on this same conveyor, the fenders enter another dip tank for the second coat of enamel which is baked for the same length of time and at the same temperature as the first coat. This unit is completely enclosed in glass; fenders and other baked enamel parts are not touched by hand until they emerge at the outfeed end of the second oven, when they are removed and placed on an overhead conveyor which carries them to the assembly line. The fender supply storage is located adjacent to the assembly line.

All heavy hardware on the chassis, such as bumper arms, receives two coats of enamel, the process being identical to that employed on fenders.

Assembled hoods are cleaned similar to car bodies in that they are washed with lacquer reducer, sanded with No. 150 aluminum oxide cloth and then given two washings, first with lacquer thinner and second with alkali solution. After being blown dry, hoods are placed on an overhead conveyor and pass through a booth where an oxide primer is sprayed on both inside and outside surfaces. Next the hoods enter an oven where the prime coat is baked for 2½ hours at 225°F. At the outfeed end of this oven the metal surfaces are dry sanded with No. 6/0 garnet paper, blown clean with air, tack-ragged and inspected.

After being returned to the conveyor, hoods are carried through two spray booths where two double coats of colored lacquer are applied and air dried after each coat. The outside metal surface is then wet sanded, using No. 280, and finish sanding with No. 320 "water" sandpaper. Then follows a wash with clear water, blow off, inspection, and a mist coat of lacquer reducer, after which hoods air-dry about one hour. Then they are placed on special tables to be hand rubbed and polished.

Radiator shells are constructed of rustless steel; however a panel in the front of the radiator shell is painted to conform with the general color scheme of the body. These shells are placed in a special masking machine which protects the rustless steel while two coats of colored lacquer are

Richelieu Pearl Essence
A Natural Finish
A finisher will find a new field of novel effects—marked by an unusual beauty with a natural depth of color.
Send for Booklet
JOS. H. MEYER BROS.
220-25th St. Brooklyn, N. Y.
Midwest Representative
M. L. Freud, Wolverine Hotel
Detroit, Mich.

sprayed on the panel. About 20 minutes drying time is allowed after each coat. Final operations include wet sanding, drying and polishing.

Radiator cores are washed in alkali solution and receive one spray coat of black enamel. This is allowed to air-dry four hours.

Front and rear system parts are washed, dried and placed on a conveyor which carries them through a spray booth where a double coat of a special black lacquer is applied.

The success of the Ford production system cannot be attributed to either men, methods, material or equipment; rather is it a coordination of all of these, with the greatest emphasis on the loyalty and interest of the men on the lines.

The Ford finish is the result of carefully applied research and a pre-determined plan based upon this same interest, loyalty and pride of the men who carry on the work.

Aluminum Paint Booklet

The Aluminum Co. of America, Pittsburgh, Pa., has ready for distribution a new 45-page, illustrated, 5½x8½-in. booklet entitled "Aluminum Paint—Its Uses, Utility and Application." This interesting booklet contains practical information about the advantages of aluminum paint, how to secure the best results with its use, and its use and application in industry.

Melting and Coating Tanks

The H. O. Swoboda, Inc., (consulting electrical and mechanical engineers) 3400 Forbes St., Oakland Sta., Pittsburgh, Pa., has ready for distribution its Bulletin No. 230, superseding Bulletin No. 170. The new bulletin describes and illustrates "Falcon's" bare electric immersion heaters for asphalts, tars, compounds, oils, varnishes, and similar viscous materials.

SIX POINT WHITE

A product chemically engineered to give a long-awaited finish for refrigerator boxes, vending machines, hospital equipment or anywhere that a uniquely superior Lacquer Finish is desired.

Point 1. Tenacious Adhesion.

Point 2. Minimum Discoloration.

Point 3. High opacity combined with smooth flow and lustrous sheen.

Point 4. Unbelievable resistance to chipping, scratching, printing and other mechanical abuse.

Point 5. Marvellous resistance to water, oil, sulphur dioxide gas, and actinic rays.

Point 6. Write us for this and further information on our "SIX POINT" White System.

The Varnish Products Co.
Cleveland, Ohio

N. B. "6-Point White" can be tinted to a wide range of desirable pastel colors.

Reduce Thinning Costs

With This High Solvency Reducer

THIN your varnishes, enamels and paints with Sunoco Spirits. Dependable and economical for dipping, spraying or brushing. Its high solvency prevents separation, jelling or thickening.

Ideal for reducing finishes to spraying consistency . . . . Effective in maintaining finishes in ideal condition for satisfactory application.

A high solvency reducer at an economical price. Conveniently located warehouses.

SUN OIL COMPANY
Philadelphia

Branches and Warehouses in 100 Cities

SUNOCO

SPIRITS

AUTOMOTIVE FINISHING COMPLETELY COVERED

A detailed study of modern methods of automobile painting; carefully written in non-technical terms. This book contains much useful information, both for the shop owner and finisher; explaining methods of preventing checking and cracking, water spotting, peeling, chipping, flaking and many other helpful ideas.

ILLUSTRATED—GOOD BINDING
16 CHAPTERS.....PRICE $3.00

Remittance with order, please

INDUSTRIAL FINISHING
802 Wulsin Bldg., Indianapolis, Ind.

Oven Baking; Annealing

Ordinarily, when one thinks of an oven being used for the baking of finishing coats, he thinks of it as being adapted only to that one operation. But this is not always the case. For instance, some metal products require annealing in an oven, but under ordinary circumstances they will oxidize and a certain amount of scale will form on the surface, this calling for another cleaning operation before they are ready for the finish.

A method has been discovered by means of which the air can be kept out of an electric annealing furnace, and since it is air that causes oxidation, the product is heated, then cooled, and emerges in suitable condition for finishing. The same type of furnace is used for vitreous enameling on a production basis. The design of the furnace is usually special, of course, depending on the particular set of conditions in each plant where it is to be installed, and also the type of material to be handled.—E. J. H.

Lacquer for Metal Protection

The results of research work in hardware metal protection are described in a 19 page booklet just issued by the Industrial Finishes Division, E. I. du Pont de Nemours & Co., Parlin, N. J. This work was carried on in connection with the development of du Pont 1130 Metal Lacquer, a new product. The booklet is 6x9¼-in. in size, and contains a number of illustrations of apparatus used in making scientific tests, photomicrographs of test panels, and other interesting pictures. A table gives comparative evaluations of 22 different lacquers. The investigation included crystal spotting under the lacquer film on oxidized finishes, stain spotting under the lacquer film on cast work, resistance to the deteriorating effect of outdoor exposure, adhesion to the metal, hardness without the sacrifice of flexibility, discoloration of the film on aging and green dip or tarnish resistance.

Nickel Brass; Chrome Brass

The American Nickeloid Co., Peru, Ill., has published a new folder describing its "Finished Raw Materials —Nickel Brass and Chrome Brass." This new folder is 4¼x5⅝-in. in size and contains a sample of both nickel brass and chrome brass. This folder with sample is available from the company to anyone interested.

Paasche Announces Changes in Personnel

The Paasche Airbrush Co., 1921 Diversey Pkwy., Chicago, Ill., announces the following changes in its personnel:

Mr. L. Straub is now manager of the New York office of Paasche Airbrush Co., located at 103 Lafayette St. He is assisted by four airfinishing engineers—Messers. G. M. Theuret, J. P. Creamer, G. C. Chatfield, and H. Abramson.

Mr. E. Evans, has been placed in charge of the Philadelphia territory of the Paasche company with offices at 2401 Chestnut St., Philadelphia, Pa.

G. O. Thomas is covering Western Iowa again for Paasche. He may be reached at 709 Olinda Ave., Des Moines, Iowa.

A. C. James, has joined the Cleveland office of Paasche, with offices at 604 Perry Payne Bldg., 414 W. Superior Ave.

H. B. Young & Co. Merge With E. T. Stille & Co.

Announcement is made by H. B. Young & Co. and E. T. Stille & Co., of Chicago, of a merger forming The Stille-Young Corporation.

These firms are well-known in the general industrial field as manufacturers of wood and metal lacquers, wood finishing materials, shellac and stains, selling particularly to furniture manufacturers and specialty manufacturers in various lines.

The new corporation will be under the control of the executives of the two former companies, and the principal representatives will continue to cover their accustomed territories.

The company will operate a plant in Chicago at 2343 Greenview Ave., where a large part of its materials will be produced.

For the south eastern trade, a plant is maintained at High Point, N. C., with facilities for the entire line of this company's products, and assuring prompt and effective distribution in that section.

It is expected that the merger will result in economies and in increased efficiency of operation, as well as a substantial increase in the volume of output.

Reduced From 10"x14" Clear Crystal Lacquer Panel

Our Latest Development

Crystal
LACQUER

Which Produces a Large Cube Design on Wood or Metal Surfaces

Write for Sample Panel and Method of Application

HENRY V. WALKER CO.
Elizabeth New Jersey

Industrial Finishing
MAGAZINE

Issued fifteenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

PRACTICAL PUBLICATIONS, Inc.
Publishers

Office: 802 Wulsin Bldg., Indianapolis, Ind. Telephone, Riley 6771. President, A. T. Gaumer; Vice-President and Managing Editor, W. H. Rohr; Secretary, R. E. Sults; Treasurer, E. A. Dosch.

Subscription rates, $2.00 per year in U. S. and possessions; $3.00 per year in Canada and other foreign countries.

Advertising rates on application.

EDITORIAL

Beautiful Cities; Steady Employment

It is to be hoped that some day the National Clean-Up and Paint-Up Campaign Bureau and other National organizations will sponsor, actively fight for and eventually get passed federal, state and municipal legislation which will compel owners of all kinds of buildings to keep them cleaned up and attractively surfaced (painted, finished, plated or simply cleaned —whatever is suited to the construction) inside and outside.

After all, the upkeep of the building is as important as the original building job if one expects to avoid rapid deterioration and early financial loss because the building becomes less desirable prematurely.

If proper maintenance work is kept up regularly, industry will enjoy an established dependable volume demand for cleaning and finishing materials, supplies and equipment, and the whole country will have taken many strides forward in solving two major problems of modern times: Permanently beautiful cities, towns and rural districts will be with us, and we will be providing steady gainful employment to a great number of workmen.

Who is there who would not be happy to see removed forever all the offensive uncleanliness, darkness, filthiness, unsanitation and fire hazards that now characterize so many old buildings in every city, town and hamlet? But that ideal can be effectively accomplished only through the passage and strict enforcement of a federal, state, and municipal legislation compelling owners of buildings to clean and properly surface them outside and inside.

Refrigerator Finish Brings New Facts to Light

In the development and improvement of its present system for finishing electric refrigerators, which is recognized as standard by leading manufacturers in that industry, a well known finish manufacturer made panel tests to the number of no less than 3,500, in groups or series of about 10 to 100 each, which were subjected to the various agencies of destruction that may affect such a finish. These panels were built up according to commercial practice, in each case varying one condition or ingredient at a time, to determine the effect of such variation on the resultant finish.

The whole field of possible ingredients was studied, including great varieties of synthetic resins, pigments, oils, plasticisers,

etc. The effect of almost imperceptible variations in proportion was determined, and final selection was made of exactly those proportions which gave most satisfactory service.

In the course of this work, it was found that a number of special instruments were required for the measurements, which had to be developed by the company's technical staff. Some of these yielded information of great value not only in the study of this particular type of finish, but for a wide range of other products.

Another feature which entered into the study, is the method of preparing the metal to receive the finish. At the outset, the system was adapted for use on sand-blasted steel; but as the manufacturers have considered the adoption of some of the numerous processes of cleaning, treating, plating, or otherwise preparing the metal to the end of securing greater resistance to oxidation, the investigations followed this work until it was believed that the present combination of methods of metal preparation and finishing represented the most advanced ideas for the purpose.

As an example of the improvement that has been brought about, it is stated that it is now possible to produce a finish having five times the durability under high humidity conditions of one which at the outset of the work was considered quite satisfactory; and this was accomplished with a correspondingly increased resistance to failure under actual outdoor exposure and accelerated weathering tests, which indicate surprising maintenance of flexibility and freedom from chalking.

This investigation represents only one of the numerous lines of work that are receiving atten-

Hy-Speed

EXPLOSION-PROOF ELECTRIC MIXERS

Clamp to *any* tank and mix *all* liquids

MIX QUICKER

LAST LONGER

COST LESS

Note Patented "Push Pull" Propeller Action

ALSOP ENGINEERING CO.

39 West 60th St. New York

Film-O-Graph

Trade Mark Registered U. S. Pat. Off.
Patent applied for

On the polished plate glass bed of the Film-O-Graph, can be spread films (12" x 4") of lacquer, paint or enamel of PREDETERMINED thickness from .002" to .02" inclusive (19 variations); for the determination of HIDING POWER.

In use in laboratories of the largest lacquer makers in U. S. A. and England. Circular on request.

PARKS EQUIPMENT CO. Bourse Building Philadelphia, Pa.

tion in this company's laboratories, in connection with their sales of specialized industrial finishes.

Classified Advertising

Advertisements under this heading 45 cents a Line per insertion, minimum charge, $1.35. In estimating, calculate six words to one line, and add one additional line for heading. Use this department to obtain help, find positions, buy and sell equipment, dispose of manufacturing properties, etc.

FINISHING FOREMAN

Desires position as foreman, or as demonstrator of finishing materials. Several years as foreman with large firms. Understands modern methods, colors and finishes. Experienced on store, office and bank fixtures, antique and novelty furniture. Can handle any number of men. Go anywhere. Address IF-394, care Industrial Finishing.

POSITION WANTED

As foreman finisher or spray operator. Twelve years' experience. Best of references. Address IF-395, care Industrial Finishing.

WELL EDUCATED FINISHING EXECUTIVE

Is open to engagement as superintendent in charge of production finishing, or as practical service man for materials manufacturer. Broad experience on automobiles, fireproof doors, elevators, metal partitions and furniture, radios, etc. Can handle any number of men. Good references. Address IF-399, care Industrial Finishing.

PRACTICAL SERVICE MAN

for industrial trade wanted by lacquer manufacturer. Sales or laboratory experience preferred. State compensation wanted. References required. Correspondence confidential. Address IF-398, care Industrial Finishing.

WANTED

Good used electric or pneumatic portable rubbing machine. Address IF-396, care Industrial Finishing.

SALESMAN WANTED

Established manufacturer of nationally advertised line of spray painting and finishing equipment requires salesmen to call on automotive, hardware and paint jobbers in choice territories. Liberal commission basis. Write fully, giving all details and territory familiar with. Address IF-397, care Industrial Finishing.

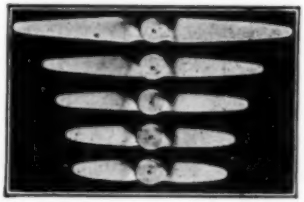
WANTED

To get in touch with manufacturers' agent calling on hardware and paint stores, lumber yards and building supply people. We have some territory still open for live man on commission basis that is acquainted with this trade to sell something new in paint. Mention territory covered and lines handled, also references. SANFORD BROTHERS INC., Chattanooga, Tenn.

BARGAINS

Demonstrator Paint Sprays, ½ price. Like new, guaranteed, factory reconditioned, gasoline or electric, completely equipped. 5-days' Trial—Money-back guarantee—one-fourth down, balance terms. KEN'S EQUIPMENT EXCHANGE, Box F-91, Troy, Ohio.

Aeroplane Type Exhaust Fan Propellers



30 inch . . . $8.50 24 inch . . . $6.00
20 inch . . . 5.00 18 inch . . . 4.50
16 inch $4.00

Made of Nickel Alloy Aluminum
Machined — Finished — Balanced
Guaranteed in every respect.

Send for descriptive circular and new low price on Complete Fans or parts to make any size exhaust or ventilating fan.

UNIVERSAL FAN CO.
1030 W. 29th St. Indianapolis, Ind

UTWAY

LACQUERS

Are of the Highest Proved Quality

And are the result of years of scientific research and development which have terminated in the discovery of a formula for lacquer which meets the severest requirements without the undesirable features heretofore prevalent. Whether it be for wood or metal finishing, **Utway** Lacquers are built to do the job perfectly.

Outstanding Features —

CLEAR LACQUERS have water-clear transparency and will retain their clear lustrous depth.

SMOOTHNESS: Their beautiful finish is due to their perfect outflowing properties.

FLEXIBILITY AND TOUGHNESS: Will not become brittle.

LIGHT AND MOISTURE PROOFNESS: Outdoor durability is their outstanding superiority since they are built to withstand the wear and tear of daily usage whether the exposure be indoors or out of doors.
Made transparent or in colors.

This is undoubtedly the lacquer you have been looking for.

Why not write us today for a sample. Our laboratory always welcomes an opportunity to assist you with your problems.

Manufactured By

Utley Products Sales Co.
Chicago

General Offices: 318 W. Randolph St.
Factory: 1664 Wright Street, Chicago

Western Repr.— A. E. Wood Co., 1514 E. Nadeau St., Los Angeles, Calif.

"It's the best one coat white job we've ever seen,"

HILO

Said a manufacturer of Metal Beds, after thorough tests of Syntol and other similar finishes, sprayed on. This satisfaction has been supported by quantity orders.

SYNTOL

ONE COAT BAKING WHITE

This is a remarkable New Industrial Baking Finish for wood and metals.

Sprayed on, Syntol hides completely in one coat, with no tendency to sag or run. It adheres firmly.

Baked at 200°F. for 3 hours, Syntol White shows no discoloration.

The glass-like hardness of the Syntol coating cannot be approached by old-type baking finishes. It does not become brittle with age. It will not break or crack on turned or sharp edges. And Syntol is unusually and permanently flexible. It will give maximum protection to your product.

Hilo Syntol One Coat Baking White is waterproof and will retain its porcelain-like color and lustre indefinitely.

Products of industries which are effecting substantial economies with HILO SYNTOL Clear and Colors:

Airplane Parts
Electrical Appliances
Metal Beds
Refrigeration Units
Toys—Wood and Metal
Washing Machines
Wood Handles
Clocks
Buttons
Steel Cabinets
Steel Shelving
Die Castings

A test under your own working conditions will demonstrate the economies you can effect in finishing costs, with Hilo Syntol. Trial lot free to quantity buyers. Test Syntol now.

HILO VARNISH CORPORATION

Brooklyn, N. Y. Chicago Philadelphia Boston

Lacquer—Clear, All Colors—Japans, Enamels, Rubber Finishes